2007 Rutgers Combined Research and Extension Annual Report

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I. Report Overview

1. Executive Summary

The New Jersey Annual Report of Accomplishments and Results is an intergrated report reflecting research and Cooperative Extension programs. The report addresses all requirements set by the Agricultural Research, Extension and Education Reform Act of 2000 (AREERA) regarding the use of Hatch Funds, Smith-Lever 3 (b) and (c) and required non-federal funds.

The report reflects the work of the New Jersey Agricultural Experiment Station (NJAES). The mission of NJAES is to enhance the vitality, health, sustainability, and overall quality of life in New Jersey by developing and delivering practical effective solutions to current and future challenges relating to agriculture; fisheries; food; natural resources; environments; public health; and economic, community, and youth development.

The programmatic focus areas for NJAES and Rutgers Cooperative Extension are listed below:

- •Production Agriculture, Horticulture and Allied Industries
- •Public Health
- •Environment and Natural Resources
- •Marine Fisheries and Aquaculture
- •Economic and Community Development
- •Industry Development
- •Community Development
- •Food and Nutrition
- •Youth Development

NJAES through station supported research and Cooperative Extension focuses on innovative approaches to applying the land grant model to address the diverse needs of a highly urbanized state. Stakeholders have been active partners in identifying critical issues to be addressed through research and Cooperative Extension.

A Rutgers NJAES Cooperative Research team assessed biomass energy potentional in New Jersey. They developed a unique calculator to quantify biomass available now and by 2020. It is estimated that approximately 65 percent of New Jersey's biomass could ultimately be converted to energy. In another bioenergy project, switchgrass is bred, a biomass source that is two to three times more efficient at producing ethanot than corn. This work will ensure that farmers in New Jersey will have high-quality varieties of grasses to supply local demand.

The Rutgers NJAES Food Innovation Center, an economic development program and business incubator, based in Bridgeton, is named, "Incubator of the Year" in services and manufacturing category by the National Business Incubation Association (NBIA). The center offers business and technical expertise to farms, agricultural cooperatives, small and mid-sized food companies, and retail and food service operations that promote locally sourced food products. The criteria for the NBIA award included services offered, program results, success stories, and financial sustainability. The NBIA estimates that about 5,000 business incubators exist worldwide.

The Rutgers NJAES Center for Vector Biology held a summit to provide a forum for input from more than 100 state, county, and university practitioners, biologists, and health professionals regarding its research and outreach priorities. The long-term goals of the center include reinvigorating old partnerships, collaborating with other universities, and moving into the international arena.

Rutgers Cooperative Extension (RCE) made tremendous impact on its constituents in 2006-2007. Continuing in the theme area of “Enhancing the Quality of Life for New Jersey,” RCE departments make a difference in the quality of life of state residents every day. The Department of Family and Community Health Sciences has focused its efforts on “New Jersey Living Well” with its Get Moving Get Healthy initiative; 4-H Youth Development continues to provide “Positive Futures for Youth” with its Science, Engineering, and Technology focus; and ARMA has broadened its programming in the area of “Agriculture and Horticulture for Environmental, Community and Human Health.” We believe that NJAES/RCE programs fit well within the overall mission of Rutgers Universityand CSREES and that with an increased audience base, reflective of New Jersey’s diverse population, we will continue to be a valued partner locally, regionally and nationally as we move our urban agenda forward.

Rutgers Cooperative Extension has taken the initiative to expand its programming to serve new audiences in our increasingly diverse state, while at the same time using new technology such as distance learning and regional meetings to continue to serve traditional audiences. Highlights of programs designed for new audiences can be found below.

Center for Urban Environments

The Rutgers New Jersey Agricultural Experiment Station (NJAES) Center for Urban Environments (CUE) recently launched

two pilot programs in the New Brunswick area. The purpose of the Volunteer Leader Development for Latino Audiences project was to develop and implement culturally sensitive leader training materials and delivery methods in order to build the Latino community's capacity to support 4-H youth development programs in New Brunswick.

Urban Youth Programming

This includes youth at risk in a variety of urban areas and through a variety of delivery modes. Successful programming includes:

Atlantic City & Pleasantville (in-school and after school programming) - subject matter: Gardening, Science & Technology, Healthy Lifestyles

Trenton (afterschool and summer day camp programming) - subject matter: adventure based programming that focuses on teambuilding, character development, etc; healthy lifestyles, science, engineering, & technology, junior master gardeners

Camden (afterschool) - subject matter: character education and junior master gardeners

Paterson & Hackensack (afterschool) - subject matter: junior master gardeners

Elizabethport (afterschool) - drop-in center programming

RutgersEnvironmental Stewards

The Rutgers Environmental Stewards program is offered by Cooperative Extension in partnership with the Duke Farms Foundation. The program has been directed to New Jersey residents who are engaged in their local communities and who serve in volunteer or hired capacities as environmental commission members, watershed associations, and advocacy groups. This new audience helps to extend the mission of Rutgers NJAES and sister institution, the Rutgers School of Environmental and Biological Sciences throughout the state.

School IPM

The New Jersey School Integrated Pest Management (IPM) Act of 2002 established a public policy requiring NJ public and private schools to implement integrated pest management practices and notify employees, parents and guardians of pesticide use in schools. In cooperation with the NJ Environmental Federation, and NJ Department of Environmental Protection, Rutgers Cooperative Extension has offered 26 training programs in 12 NJ counties attended by 1,966 public and private School IPM Coordinators.

Barnegat Bay Shellfish Restoration Project

The Shellfish Restoration Project serves to educate residents about the coastal bay, its watersheds and peoples' impact on these natural resources by using the hard clam and oyster as living representatives of the bay ecosystem. These individuals are taught about the requirements needed by these shellfish and serve as watchdogs for good water quality and stewards of the natural resources.

Developing Future Leaders for the Horse Industry

Resulting from an Equine Science Center Stakeholder Meeting, where a public concern was the lack of new leadership in the equine industry, this outreach program was the first of its kind nationally.

This two-day short course featured several well known experts in the field. Subjects included the value of the equine industry, networking and relationship-building, decision-making strategies, leadership practices and behaviors, building coalitions, and industry management. The course brought together and equal balance of professional horse people and SEBS undergraduate and graduate students.

Rutgers Cooperative Extension departments and administrative leadership have made a major impact at the local, state, regional, and national levels in 2006-2007. In the past two years RCE faculty and staff have garnered over $32 Million in outside grants and contracts and have published 2.1 refereed journal articles/FTE; higher than most departments at SEBS/NJAES. County support is at an all time high, totaling $7.5 Million in 2007, compared to $4.5 Million in 2002. Shown in the table and figure below is the breakdown of RCE funding. Unlike most of the other land grant institutions, the majority of RCE funding comes from extramural sources. While our federal, state, and county “partner” funding is the major source used for salaries of faculty and staff, the in excess of $14 million in grants and contracts are dollars that are used primarily for program support. The “Investment in the Future” task force has been successful at changing the manner of conducting business in RCE from relying on state and federal subsidies to intrapreneurship, including increased grantsmanship, development and gifts, and cost-recovery strategies. Since 2006 all Extension Specialists have been actively engaged in undergraduate and graduate teaching and their line splits reflect an appropriate IDR component. RCE administration is currently assisting the Director of NJAES transition the specialists from a separately administered department (Department of Extension Specialists) to become fully integrated into appropriate discipline departments.

County support is at an all time high, totaling $7.5 Million in 2007, compared to $4.5 Million in 2002. Shown in the table and figure below is the breakdown of RCE funding. Unlike most of the other land grant institutions, the majority of RCE funding comes from extramural sources. While our federal, state, and county “partner” funding is the major source used for salaries of faculty and staff, the in excess of $14 million in grants and contracts are dollars that are used primarily for program support. The “Investment in the Future” task force has been successful at changing the manner of conducting business in RCE from relying on state and federal subsidies to intrapreneurship, including increased grantsmanship, development and gifts, and cost-recovery strategies. Since 2006 all Extension Specialists have been actively engaged in undergraduate and graduate teaching and their line splits reflect an appropriate IDR component. RCE administration is currently assisting the Director of NJAES transition the specialists from a separately administered department (Department of Extension Specialists) to become fully integrated into appropriate discipline departments.

RutgersCooperative Extension Funding – FY ’07	$34,725,472
Federal Smith Lever 3b & c	$ 2,486,748
Federal Smith Lever 3d	$ 1,374,724
Subtotal Federal	$ 3,861,472
State	$ 8,964,000
County	$ 7,500,000
Grants/Contracts	$14,400,000

In 2006-07 Rutgers Cooperative Extension made numerous faculty and staff hires: 3 faculty Educators in the Department of Family and Community Health Sciences; 1 faculty Agent and 4 Program Associates in the Department of 4-H Youth Development; 2 faculty Agents in the Department of Agricultural and Resource Management Agents; and a Senior Program Coordinator in the Department of Extension Specialists.

It has been the goal of RCE to integrate programming across RCE departments and focus on integrated Research/Cooperative Extension projects and programs. Programmatic accomplishments described in the 2007 Annual Report reflect these integrated efforts of the Extension departments: Agricultural and Resource Management Agents (ARMA), Family and Community Health Sciences (FCHS), 4-H Youth Development, and the Department of Extension Specialists.

Total Actual Amount of professional FTEs/SYs for this State

Year:2007	**Extension**		**Research**	
	1862	**1890**	**1862**	**1890**
Plan	156.0	0.0	65.0	0.0
Actual	130.0	0.0	69.0	0.0

II. Merit Review Process

1. The Merit Review Process that was Employed for this year

- Combined External and Internal University External Non-University Panel

2. Brief Explanation

Peer institutions in the Northeast had an opportunity to review the 2007-2011 Plan of Work. They were asked to comment on the merit and scientific quality of the plan. In addtion to the peer review, internally both the Extension and research committees of the NJAES Board of Managers had an opportunity to review and comment on the plan.

III. Stakeholder Input

1. Actions taken to seek stakeholder input that encouraged their participation

- Use of media to announce public meetings and listening sessions
- Targeted invitation to traditional stakeholder groups
- Targeted invitation to non-traditional stakeholder groups
- Targeted invitation to traditional stakeholder individuals
- Targeted invitation to non-traditional stakeholder individuals
- Targeted invitation to selected individuals from general public
- Survey of the general public
- Other (focus group sessions)

Brief Explanation

A variety of methods are used to engage our many publics in the program planning and budget process. During 2007 county stakeholder meetings where held throughout the state.The Director and Associate Director of Extension attend these meeting which serve as an open forum for state residents to identify critical issues and needs.

2(A). A brief statement of the process that was used by the recipient institution to identify individuals and groups stakeholders and to collect input from them

1. Method to identify individuals and groups

- Use Advisory Committees
- Use Internal Focus Groups
- Use External Focus Groups
- Open Listening Sessions
- Needs Assessments
- Use Surveys

Brief Explanation

At the county and state level faculty and staff engage partners and potential clientele in a variety of processes to collect input. Opportunities to participate in the process are widely publicized.

2(B). A brief statement of the process that was used by the recipient institution to identify individuals and groups who are stakeholders and to collect input from them

1. Methods for collecting Stakeholder Input

- Meeting with traditional Stakeholder groups
- Survey of traditional Stakeholder groups
- Meeting with traditional Stakeholder individuals
- Survey of traditional Stakeholder individuals
- Meeting with the general public (open meeting advertised to all)
- Survey of the general public
- Meeting specifically with non-traditional groups
- Survey specifically with non-traditional groups
- Meeting specifically with non-traditional individuals
- Survey specifically with non-traditional individuals
- Meeting with invited selected individuals from the general public
- Survey of selected individuals from the general public

Brief Explanation

Stakeholder input on the program planning process is highly valued and all efforts are made to engage our many publics as well as those who have been underserved.

3. A statement of how the input was considered

- In the Budget Process
- To Identify Emerging Issues
- Redirect Extension Programs
- Redirect Research Programs
- In the Staff Hiring Process
- In the Action Plans
- To Set Priorities

Brief Explanation

County and state level faculty and staff engge in strategic planning for improved program delivery and management of the Cooperative Extension and Research projects using data gathered from stakeholders. Stakeholders are also engaged in these processes.

Brief Explanation of what you learned from your Stakeholders

Stakeholder meetings result in the identification of priority needs on the local level that could benefit from Cooperative Extension programing or research solutions. The Developing Future Leaders in the Horse Industry is a prime example of an education program resulting from a stakeholder meeting. Stakeholders were concerned about a lack of new leadership in the equine industry.

IV. Expenditure Summary

1. Total Actual Formula dollars Allocated (prepopulated from C-REEMS)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
2486748	0	4280046	0

2. Totaled Actual dollars from Planned Programs Inputs

	Extension		Research	
	Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
Actual Formula	1518946	0	2543786	0
Actual Matching	6168716	0	3697678	0
Actual All Other	6526408	0	3814901	0
Total Actual Expended	14214070	0	10056365	0

3. Amount of Above Actual Formula Dollars Expended which comes from Carryover funds from previous years

Carryover	0	0	0	0

V. Planned Program Table of Content

Program #1

V(A). Planned Program (Summary)

1. Name of the Planned Program

Water Quality & Quantity

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
111	Conservation and Efficient Use of Water	20%		20%	
112	Watershed Protection and Management	50%		50%	
133	Pollution Prevention and Mitigation	20%		20%	
605	Natural Resource and Environmental Economics	10%		10%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2007	Extension		Research	
	1862	1890	1862	1890
Plan	5.2	0.0	4.0	0.0
Actual	7.0	0.0	3.5	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
115060	0	89222	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
406474	0	174183	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
556357	0	1212567	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

•Work with municipalities to help them meet their regulatory responsibilities on stormwater management and watershed restoration
•Perform experiments to investigate what the current nutrient loads are in NJ water
•Determine the best methodologies for developing Total Maximum Daily Load (TMDL) values for NJ waterways
•Examine the effectiveness of alternative onsite wastewater treatment systems
•Provide scientifically sound advice to state regulatory bodies on water quality issues
•Math modeling of contamination transport in surface and groundwaters
•Create a program comprising of faculty, staff, volunteers, industry partners and government officials

2. Brief description of the target audience

•Municipalities
•State Dept. of Environmental Protection
•Staff and students who gain valuable scientific experience
•Industry partners who learn ways to meet water quality standards
•Communities who learn watershed restoration methods
•NJAES Faculty and Staff involved in water research/outreach
•School age youth
•Residents

V(E). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
Plan	2000	30000	800	2000
2007	2200	25000	500	1500

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year	Target
Plan:	0
2007 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan			
2007	4	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Short term

Year	Target	Actual
2007	15000	40000

Output #2

Output Measure

- Medium term

Year	Target	Actual
2007	18000	0

Output #3

Output Measure

- Rain gardens constructed, newsletters produced, 30 educational programs, 15 students supervised (undergraduate/graduate)

Year	Target	Actual
2007	{No Data Entered}	0

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O No.	Outcome Name
1	Long Term A safe and secure water supply for all communities and industries in the state An effective and efficient nutrient-trading program that meets the needs of industry and meets the standards set by the state regulatory bodies.
2	A safe and secure water supply for all communities and industries
3	A safe and secure water supply for all communities and industries in the state
4	A safe and secure water supply for all communities and industries in the state. An effective and efficient nutrient-trading program that meets the needs of industry and meete the standards set by the state regulatory bodies.
5	A safe and secure water supply for all communities and industries in the state. An effective and efficient nutrient-trading program that meets the needs of industry and the standards set by the stte regulatory bodies.
6	A safe and secure water supply for all communities and industries in the state. An effective and efficient nutrient-trading program that meets the needs of industry and meets the standards set by the state regulatory bodies.

Outcome #1

1. Outcome Measures

Long Term

A safe and secure water supply for all communities and industries in the state

An effective and efficient nutrient-trading program that meets the needs of industry and meets the standards set by the state regulatory bodies.

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	20000	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Water Quality and Watershed Protection Through Rain Garden Education

The Robinson's Creek Branch of the Rahway River, located in NJ's Watershed Management Area 7, is moderately impaired for aquatic life, fecal coliform and total phosphorus. Severe flooding and drought conditions often plague the area. A rain garden is a shallow depressed area landscaped with native plants designed to capture and recharge stormwater runoff on residential properties. The installation of rain gardens into existing landscapes is a recommended Best Management Practice (BMP) to improve water quality and the related issues in the watershed area. Residential property owners need to be educated about how design, install and maintain rain gardens.

What has been done

A rain garden education curriculum for volunteer Master Gardeners and the general public focusing on stormwater management and the use of rain gardens to protect groundwater resources was developed. Objectives of the program are to:
-educate volunteer Master Gardeners and the general public about rain gardens and their benefits to water quality and watershed protection;
-teach installation and maintenance techniques for public demonstration and private residential rain gardens;
-install and maintain public demonstration rain gardens;
-create educational materials promoting residential rain gardens, including;
* slide presentation on rain garden installation and maintenance
* native plant lists
* poster
* website

To meet these objectives:
-Thirty-one Rutgers Master Gardeners in Union County completed a stormwater management course taught by Rutgers Specialist in Water Quality, and the Rutgers Water Quality Coordination Program staff in January of 2005.
-Master Gardeners, with assistance from local public works departments and Rutgers Water Quality Coordination Program staff, installed four public rain gardens in the fall of 2005. The rain gardens are located at: Walnut Avenue Elementary School and Hanson Park in Cranford, NJ; Fanwood Public Library, Fanwood, NJ and the Woodbridge Health Department, Woodbridge, NJ.
-Eighty-five elementary school students and 30 adults, including municipal and county planning board members and a Freeholder, participated in a rain garden education programs at demonstration sites taught by County Agricultural Agent and Rutgers student intern in the summer of 2006.
-Twenty residents, including the mayor of Springfield, participated in a rain garden installation demonstration at the Springfield Municipal Building Annex in the spring of 2007.

Results

Program evaluations and follow-up surveys indicated the audiences increased their awareness of groundwater protection. Thirty adult participants completed pre/post tests at the educational events. Their scores improved by an average of 13%. Participants increased their knowledge of the parts of a rain garden, the proper depth of a rain garden, care of native grasses, and the limited use of fertilizers in rain gardens.

Fifty-six students completed a program evaluation:
-on a scale of 1 to 3, 3 indicating that they learned a lot, students rated their learning about protecting water as 2.71 and rain gardens as 2.63;
-68% of the students will tell someone what they learned about rain gardens; and
-96% would like to learn more about protecting groundwater.
As a result of the Rain Garden Education program five demonstration rain gardens were planted to treat and recharge water run-off from 17,000 square feet of impervious surface. Approximately one million gallons of water have been treated.

A follow-up mail survey of the participants in the volunteer Master Gardener and adult education programs showed:
*Two participants reported that they installed rain gardens on their properties.
*The gardens cover 125 square feet and treat runoff from 372 square feet of impervious surface.
*Both rain gardens have reduced water seepage problems in the participants' basements.
*Two participants noted they plan to install rain gardens in the future.

Reasons participants gave for not installing rain gardens were: poor drainage on their property, the cost of installing a garden and not being physically capable of planting a rain garden. To assist property owners who need aid with labor and improving drainage on their property, a training program for professional landscape companies will be offered in North and South Jersey in February, 2008. The training program will help professionals expand the services they offer to residential clientele.

The follow-up survey also asked participants about what they learned. They rated their knowledge about rain gardens, on a scale of 1 - 5, 1 being low, 5 being high. Thirty-six participants indicated an increase in their knowledge about the following topics:

Knowledge before demonstration
Average Rating
2.44: Topic - Definition of a watershed
3.16: Topic - Definition of groundwater
2.60: Topic - Definition of a rain garden
2.83: Topic - Ways to protect groundwater
2.15: Topic - Where to locate a rain garden
1.80: Topic - How to prepare a rain garden site
1.90: Topic - Proper depth of a rain garden
1.83: Topic - How to maintain a rain garden

Knowledge after demonstration
Average Rating
4.16: Topic - Definition of a watershed
4.89: Topic - Definition of groundwater
5.00: Topic - Definition of a rain garden
4.67: Topic - Ways to protect groundwater
4.39: Topic - Where to locate a rain garden
4.90: Topic - How to prepare a rain garden site
4.40: Topic - Proper depth of a rain garden
4.22: Topic - How to maintain a rain garden

4. Associated Knowledge Areas

KA Code	Knowledge Area
112	Watershed Protection and Management

Outcome #2

1. Outcome Measures

A safe and secure water supply for all communities and industries

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Water Allocation

All producers who irrigate crops must complete paper work to register their irrigation intakes and establish a water use allocation deemed acceptable by the NJ DEP. Those who irrigate less than 3.1 million gallons a month (MGM) are required to apply for an agricultural water use registration whereas those who irrigate above 3.1 MGM must apply for an agricultural water use certification. Once approved, this permit is effective for a five year period and annual water use form must be submitted to NJ DEP by February 28 of the year following the one when the water was utilized. Starting this year, rules have been established that if a farm lies within the boundaries of the Delaware River Basin, the producer must apply for a docket number from the Delaware River Basin Commission (DRBC). This docket number is necessary because without it, NJ DEP will not process applications for agricultural registrations or certifications, and without NJ DEP approval, a producer may not legally irrigate their crops.

What has been done

Producers who irrigate and need to establish and/or maintain an agricultural water use registration or certification must obtain documentation as well as approval from the county agricultural agent. One-on-one assistance with filling out the application is provided when needed since the paperwork can prove to be overwhelming to producers. Assistance can be anything from helping calculate water use to creating maps or diversion sources to helping interpret unclear language on the application forms. In order to educate producers on what is needed to obtain and maintain a water allocation, as well as how to meet requirements under NJ DEP's new rulings for water allocation, meetings have been held in the office.

Results

With permits numbered up to SA0194, the rules of NJ DEP and the DRBC regarding water use and allocation affects a majority of the farming operation in Salem County. Since Salem County is one of the largest agricultural counties in the state, outreach to the farmers who utilize irrigation in their operation about water allocation has been a priority for the Salem County Extension office. The one-on-one meetings with producers help establish relationships with Rutgers Cooperative Extension and the agricultural community in Salem County. Twenty Salem County farmers submitted applications for permit renewals, four producers applied for new agricultural water use certifications, and three producers applied for new agricultural water use registrations in 2007. The meetings that were held regarding water allocation ruling with the NJ DEP and DRBC were beneficial for producers to attend since rulings were explained thoroughly by those who implement them. Assisting in obtaining and maintaining agricultural water use certifications and registrations has proven to bring great relief to producers who irrigate who may be intimidated by the formal process of application.

4. Associated Knowledge Areas

KA Code	Knowledge Area
112	Watershed Protection and Management
111	Conservation and Efficient Use of Water

Outcome #3

1. Outcome Measures

A safe and secure water supply for all communities and industries in the state

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Cranberry Water Dynamics

Cranberry production in New Jersey is an important crop that has been grown for 150 years. Modern production practices need an abundant, purest water source to irrigate, harvest, and cool the crop. As the state continues to develop, competition for water resources is intense. This program looks at various components of soils so that the cranberry vines can grow efficiently with the least amount of water resources.

What has been done

This program took a multifaceted approach to maximizing usage of a natural resource, namely water. Field studies were undertaken at 5 farm sites to study infiltration as well as soil amendments that would improve drainage through impervious soil layers. Data was analyzed and PowerPoint presentations made that were presented to growers throughout New Jersey and other cranberry producing states. Sanding cranberry bogs results in buried organic layer which were evaluated in this study

Results

Results showed that despite many different types of organic and other compacted layers, bog soils usually retains the ability to move water through the profile. Areas that had foot traffic, irrigation equipment, or were formed from heterogeneous materials proves less than acceptable resulting in partially anaerobic situations. The usage of soil penetranats did not make an appreciable different in drainage is areas where soil modeling occurred.

4. Associated Knowledge Areas

KA Code	Knowledge Area
111	Conservation and Efficient Use of Water

Outcome #4

1. Outcome Measures

A safe and secure water supply for all communities and industries in the state.
An effective and efficient nutrient-trading program that meets the needs of industry and meete the standards set by the state regulatory bodies.

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Water Quality

Two watersheds, the Upper Cohansey River and Upper Salem River, were deemed by NJ DEP as impaired for fecal coliforms and phosphorus as well as other water quality parameters. Total maximum daily loads (TMDL) were established in both watersheds so that a goal for a level of reduction could be established. The land use in both watersheds is predominately agriculture, so remediation efforts are concentrated the agricultural community and their management. Runoff from farms carries nutrients such as nitrogen, phosphorous and fecal coliforms into groundwater and surface water. Nutrient enrichment of water as a result of nitrogen and phosphorous can result in abundant algae growth and the production of toxins; thereby depleting water quality.

What has been done

In the Upper Cohansey Watershed project, data were analyzed from prior water sampling events to determine how to best remediate water quality. Through the use of microbial source tracking, fecal coliforms were identified as human, bovine or other in order to find their source. A data model was also established to identify sub watersheds within the Upper Cohansey River that needed the most attention for remediation projects. In the Upper Salem River Watershed, phase two of the restoration project took place. Water sampling within the impaired region of the Salem River Watershed was conducted in order to determine the presence of nutrients and microbes. Microbial source tracking was also used in this project.

The targeted audience was those who have land within the Upper Cohansey River and Upper Salem River watersheds. Since the land use in both watersheds is predominately agriculture, those who participate in agricultural activities are a primary target. These individuals were willing to participate in remediation efforts to enhance the water quality in the watersheds in their area. Additional funding and cost share programs would further accelerate remediation efforts

Results

It was found in the sampling data that in the Upper Cohansey Watershed the fecal coliforms in the water were predominately human. The area most impaired is a sub watershed where a sewer system is in place, indicating that its infrastructure may be failing and in need of repair. Phosphorus levels were found to be high, especially in wet weather, indicating that phosphorus loading takes place in runoff from erosion. Since the watershed's land use is mostly agriculture, the concentration of remediation efforts is on farms within the Upper Cohansey River watershed. A farm advisory committee made up of the farmers within the Upper Cohansey and Upper Salem watersheds was established to formulate potential solutions to enhance water quality. Assuming funding is available, there will be priority for projects on these farms in deemed critical areas. Some potential remediation projects include cover crop incentives, tail water recovery systems and the planting of buffer strips on field edges. The Upper Salem River watershed was sampled in ten locations between Daretown Lake and Memorial Lake, on a bi-weekly basis from the spring through the end of the year. Data has been collected and will be analyzed to make a model, similar to that completed in the Upper Cohansey project. With the findings in the Upper Cohansey River and Upper Salem River watersheds, funding for future endeavors within these watersheds should be made available through the NJ DEP.

4. Associated Knowledge Areas

KA Code	Knowledge Area
112	Watershed Protection and Management
133	Pollution Prevention and Mitigation
111	Conservation and Efficient Use of Water

Outcome #5

1. Outcome Measures

A safe and secure water supply for all communities and industries in the state.
An effective and efficient nutrient-trading program that meets the needs of industry and the standards set by the stte regulatory bodies.

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Nutrient Management Planning

Nitrogen and phosphorous are the two nutrients that are managed in order to protect surface and ground water quality. Nitrogen leaching out of the root zone can enter subsurface drains and be transported directly to surface waters or leach to ground water. Nitrate above 10 parts per million (ppm) in water is a health risk. Concentrations above this level can cause fatality in infants and cattle abortion. Excess nitrogen in the form of ammonia can kill salmonid fish species. Phosphorous entering surface waters leads to accelerated weed and algae growth causing depressed oxygen levels in the water that impairs aquatic life and can cause odors or bad taste. Excess algae growth has also been associated with toxic dynoflagellates, such as physteria. The Comprehensive Nutrient Management Plan (CNMP) is designed to minimize the transport of nitrogen and phosphorous to surface waters.

What has been done

Nutrient management and waste utilization means managing the source, rate, form, timing, placement, and utilization of manure, rather than disposing of it as a waste residual. The goal is to effectively and efficiently use nutrient resources derived from animal waste to adequately supply soils and plants to produce food, forage, fiber, and cover while minimizing environmental impacts. The CNMP is a component of the Resource Management System for the farm. It is used in conjunction with crop rotations, residue management, pest management, conservation buffers, and other practices needed on a site-specific basis.

Results

As a result of 2007 CNMP development, plans for the utilization of 1,574 Tons of manure were implemented. The producers participated by analyzing soil sample results, calibrating manure spreaders, and agreeing to maintain accurate records relating to yield and manure spreading. While developing a CNMP, producers are forced to view their overall operation including potential risks to the environment as well as the most economic use of nutrients. Upon learning the role of pre-sidedress nitrogen testing, a corn producer decided to implement it as a management tool on his farm to reduce excess nitrogen applications in the future. Every producer decided to re-calibrate their manure spreader to ensure accurate application of manure. Two producers were able to identify potentially high risk spreading areas in relation to surface water.

4. Associated Knowledge Areas

KA Code	Knowledge Area
133	Pollution Prevention and Mitigation

Outcome #6

1. Outcome Measures

A safe and secure water supply for all communities and industries in the state.
An effective and efficient nutrient-trading program that meets the needs of industry and meets the standards set by the state regulatory bodies.

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Natural Resources Management & Environmental Protection

As a rapidly growing county, Monmouth County faces several major environmental and natural resource issues related to land use and water supply. Such concerns include residential, industrial and open space needs, water quantity/quality for irrigation and recreation, non-point source pollutants, stormwater runoff, healthy food, and drinking water supplies. Over 75% of county streams are rated as moderately to severely impaired by the NJ Department of Environmental Protection. Monmouth is unique within the state in having the headwaters of six watersheds originate within its boundaries. These important watersheds draw their water from lands used by rural and suburban populations, farms, golf courses, parks, state forests, light industry, commercial fisherman, commercial boaters and recreational activities. The Agent's programmatic focus is organizing scientific knowledge, disseminating facts about agricultural, municipal and home gardener contributions to non-point source pollution and providing best management solutions.

What has been done

The Microbial Source Tracking Committee met twice to determine better methods of bacterial and viral tracking and measurement.

A two year agricultural characterization of the Wreck Pond watershed conducted by Rutgers Extension was summarized at numerous municipal and county meetings.

Three stormwater and rain garden seminars, 3 town meetings and 5 community sessions were provided for municipal officials, landscapers, environmental organizations and home owners.

As principal investigator, the agent was funded $38,000 annually to begin a new agricultural characterization of the Colts Neck watershed similar to that of the Wreck Pond.

Results

Specific outcomes include the following:

* Agent has provided specific facts and rationale for farmland preservation, farmer conservation, voluntary compliance and environmental advantages of best management practices on over 180 farms. He has provided soil analysis and fertility recommendations on over 1,600 farm sites.
* Over 260 of his farmer clients have adopted approved practices that build soil fertility, improve water infiltration, re-charge aquifers, provide streamside buffering and/or aid flood control.
* The Agent has provided soil analysis recommendations that have reduced excessive phosphorus fertilization by 55,000 pounds from 2006-2007.

Membership increased on the Microbial Source Tracking Committee from 5 to 25 to 45. A newly established website was begun with EPA Region 2.

DEP granted $1.1 million dollars in 2007 to finance the scientific recommendations for stormwater management by the Wreck Pond Technical Advisory Committee. The DEP also provided $22,000 for six demonstrational rain gardens to remediate stormwater runoff in the Wreck Pond area.

More municipal officials complied with stormwater regulations due to Rutgers training efforts.

Municipal officials and homeowners began plans and preparations for over 12 demonstration rain gardens throughout Monmouth County to divert, recharge and conserve stormwater.

4. Associated Knowledge Areas

KA Code	Knowledge Area
112	Watershed Protection and Management

133 Pollution Prevention and Mitigation

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought,weather extremes,etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programatic Challenges
- Populations changes (immigration,new cultural groupings,etc.)

Brief Explanation

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- Before-After (before and after program)
- During (during program)
- Time series (multiple points before and after program)
- Comparisons between program participants (individuals,group,organizations) and non-participants
- Comparisons between different groups of individuals or program participants experiencing different levels of program intensity.
- Comparison between locales where the program operates and sites without program intervention

Evaluation Results

Evaluation results are unique to each program. See Qualitative Outcome Statements.

Key Items of Evaluation

Program #2

V(A). Planned Program (Summary)

1. Name of the Planned Program

Youth/Adult Obesity

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
701	Nutrient Composition of Food	10%		10%	
702	Requirements and Function of Nutrients and Other Food Cor	25%		25%	
703	Nutrition Education and Behavior	25%		25%	
724	Healthy Lifestyle	40%		40%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2007	Extension		Research	
	1862	1890	1862	1890
Plan	4.9	0.0	5.0	0.0
Actual	24.0	0.0	4.7	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
100287	0	100946	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
797080	0	203725	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
4216284	0	128863	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

- To identify the factors that promote excessive weight gain as well as protect against childhood obesity
- Measure how children born small for age are different with respect to body composition and risk for diabetes prior to developing diabetes or obesity.
- Investigate how perilipin A works in adipocytes to control fat storage and fat breakdown.
- Collect and analyze data on obesity-related measures (i.e., BMI) in adults and children
- Examine how weight loss affects calcium absorption and bone mass
- Create a multidisciplinary program comprising of faculty, staff, the medical community, industry partners and government officials
- Conduct adult/youth education and deliver targeted messages on healthy food choices and increased physical activity education using the following strategies:

Direct Methods:
- Educate Youth
- Educate Parents
- Educate Volunteers
- Food and Fitness Ambassadors
- Educate Professionals
  -Child Health Summit
- Educate Teachers/School Nurses
- Educate Communities

Indirect Methods:
- Website

2. Brief description of the target audience

•Clinicians and Physicians Nurses
S chool
•Health Care Professionals
•Hospitals (including teaching hospitals)
•Staff and students who gain valuable scientific experience
•Industry partners that benefit from fundamental and applied research in obesity and related chronic diseases
•Communities that benefit from increased knowledge about the mechanisms involved in obesity
•Other faculty and staff working on similar research
•Health-related organizations and foundations interested in obesity/nutrition issues
•School Age Youth
•Teens
•Teachers
•After School Providers
•Parents
•Volunteers
•Extension Professionals
State and County Agencies and Organizations

V(E). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
Plan	3000	20000	1000	1000
2007	6200	10778	10	500

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year	Target
Plan:	0

2007 : 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan			
2007	19	17	36

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Short Term

Year	Target	Actual
2007	12500	8440

Output #2

Output Measure

- Medium Term

Year	Target	Actual
2007	13000	6182

Output #3

Output Measure

- Newsletters, Health Summits, news articles, 24 radio programs, 737 office visits, 375 educational programs, trained volunteers

Year	Target	Actual
2007	{No Data Entered}	0

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O No.	Outcome Name
1	Long Term Individuals experience: Decreased overweight and obesity for youth/adults Decreased risk factors for nutrition-related health problems and chronic diseases that are affected by diet and physical activity for youth/adults A clear and comprehensive understanding of the genetic and physiological mechanisms of obesity and related chronic diseases Pharmacological and/or medical treatments to alleviate the effects of obesity and related diseases
2	Short Term - Individuals gain awareness, knowledge, skills related to: - Attitudes about healthy eating for adults/youth - Healthy food choices for adults/youth - Selection of healthy foods for adults/youth -Benefits of physical activity, (reduced overweight and obesity, reduced risk of diabetes, heart disease and cancer) -Physical activity recommendations for health for adults/youth -RCRE -Identify factors that promote excessive weight gain as well as protect against childhood obesity -Understand the molecular mechanisms of lipid transport in the intestinal cell - Demonstrate the affects of calcium absorption and bone mass by weight loss.
3	Short Term - Individuals gain awareness, knowledge, skills related to: - Attitudes about healthy eating for adults/youth - Healthy food choices for adults/youth - Selection of healthy foods for adults/youth -Benefits of physical activity, (reduced overweight and obesity, reduced risk of diabetes, heart disease and cancer) -Physical activity recommendations for health for adults/youth -RCRE -Identify factors that promote excessive weight gain as well as protect against childhood obesity -Understand the molecular mechanisms of lipid transport in the intestinal cell - Demonstrate the affects of calcium absorption and bone mass by weight loss
4	Short Term: Individuals gain awareness, knowledge, skills related to: - Attitudes about healthy eating for adults/youth - Healthy food choices for adults/youth - Selection of healthy foods for adults/youth -Benefits of physical activity, (reduced overweight and obesity, reduced risk of diabetes, heart disease and cancer) -Physical activity recommendations for health for adults/youth -RCRE -Identify factors that promote excessive weight gain as well as protect against childhood obesity -Understand the molecular mechanisms of lipid transport in the intestinal cell - Demonstrate the affects of calcium absorption and bone mass by weight loss

5	Short Term- Individuals gain awareness, knowledge, skills related to: - Attitudes about healthy eating for adults/youth - Healthy food choices for adults/youth - Selection of healthy foods for adults/youth -Benefits of physical activity, (reduced overweight and obesity, reduced risk of diabetes, heart disease and cancer) -Physical activity recommendations for health for adults/youth -RCRE -Identify factors that promote excessive weight gain as well as protect against childhood obesity -Understand the molecular mechanisms of lipid transport in the intestinal cell - Demonstrate the affects of calcium absorption and bone mass by weight loss
6	Short Term--Individuals gain awareness, knowledge, skills related to: - Attitudes about healthy eating for adults/youth - Healthy food choices for adults/youth - Selection of healthy foods for adults/youth -Benefits of physical activity, (reduced overweight and obesity, reduced risk of diabetes, heart disease and cancer) -Physical activity recommendations for health for adults/youth -RCRE -Identify factors that promote excessive weight gain as well as protect against childhood obesity -Understand the molecular mechanisms of lipid transport in the intestinal cell - Demonstrate the affects of calcium absorption and bone mass by weight loss
7	Short Term: Individuals gain awareness, knowledge, skills related to: - Attitudes about healthy eating for adults/youth - Healthy food choices for adults/youth - Selection of healthy foods for adults/youth -Benefits of physical activity, (reduced overweight and obesity, reduced risk of diabetes, heart disease and cancer) -Physical activity recommendations for health for adults/youth -RCRE -Identify factors that promote excessive weight gain as well as protect against childhood obesity -Understand the molecular mechanisms of lipid transport in the intestinal cell - Demonstrate the affects of calcium absorption and bone mass by weight loss.

Outcome #1

1. Outcome Measures

Long Term

Individuals experience:

Decreased overweight and obesity for youth/adults
Decreased risk factors for nutrition-related health problems and chronic diseases that are affected by diet and physical activity for youth/adults
A clear and comprehensive understanding of the genetic and physiological mechanisms of obesity and related chronic diseases
Pharmacological and/or medical treatments to alleviate the effects of obesity and related diseases

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	16000	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior
724	Healthy Lifestyle

Outcome #2

1. Outcome Measures

Short Term - Individuals gain awareness, knowledge, skills related to:
- Attitudes about healthy eating for adults/youth
- Healthy food choices for adults/youth
- Selection of healthy foods for adults/youth
-Benefits of physical activity, (reduced overweight and obesity, reduced risk of diabetes, heart disease and cancer)
-Physical activity recommendations for health for adults/youth
-RCRE
-Identify factors that promote excessive weight gain as well as protect against childhood obesity
-Understand the molecular mechanisms of lipid transport in the intestinal cell
- Demonstrate the affects of calcium absorption and bone mass by weight loss.

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Get Moving - Get Healthy Family Fun Events

A September 2004 Childhood Weight Status report published by the New Jersey Department of Health and Senior Services indicated that 20% of New Jersey's sixth graders are obese and another 18% are overweight. Based on these statistics, the number of overweight and obese youth in New Jersey is higher than the national average.

A 2005 New Jersey Student Health Survey of Middle and High School Students conducted by the NJ Department of Education revealed that 75% of high school students surveyed do not consume fruits or fruit juices at least once a day. 89% of high school students did not eat at least one vegetable a day. 65% of high school students and 63% of middle school students were drinking less than a glass of milk a day.

The same study found that 25% of high school students and 20% of middle school students were not physically active for at least 60 minutes at least one day of the week. Another 38% of high school students and 34% or middle school students indicated they were only physically active for 60 minutes 1- 3 days in one week. These statistics indicate a strong need for New Jersey's youth to better understand the nutritional and physical activity requirements needed to live a healthy life.

What has been done

Family Fun Events were held at locations in nine New Jersey Counties. The events utilized the Get Moving - Get Healthy with New Jersey 4-H action kits and curriculum that were developed to provide a way for a unified educational message to be used throughout the state with a recognizable title and logo. In 2005, the program was developed through a collaboration between teens and adults. Teens were trained as 4-H Food and Fitness Ambassadors, learning about basic nutrition and the importance of physical activity for healthy living. The teens then developed the title and logo for the program. They screened various activities and selected ones to be included in a hands-on activity kit. The kits and curriculum have three major focus areas - understanding MyPyramid, identifying portion sizes, and learning easy ways to exercise.

As part of the GMGH initiative's commitment to youth and adult partnerships, current Food and Fitness Ambassadors and 4-H staff worked together to plan the GMGH Family Fun events, develop the marketing and promotion plan, and train 8 new Food and Fitness Ambassadors. The current Food and Fitness Ambassadors and 4-H staff developed strategies to market and promote the GMGH Family Fun events. The group created press releases, newspaper ads, and other promotional pieces to use prior to and after the event.

Each Family Fun Event started with family members completing a pre-test. The event used the existing GMGH kits to provide a variety of hands-on activities for families including - Exercise Challenge, Finding Your Pyramid, Healthy Plate, Measure Up, Portion Distortion, Read the Label, Serving Match, Think What You Drink, and What Counts. Educational materials with tips to increase physical activity and to prepare nutritious meals were provided. Participants also be made a healthy snack. At the conclusion of the event, all family members completed a post-test and each family completed a "health pledge" to set at least three goals for the family to accomplish in the following six weeks to improve the health of the family.

Results

-A 4-hour training program was conducted to introduce new Food & Fitness Ambassadors to the Get Moving - Get Healthy with New Jersey 4-H program and how to implement the Family Fun Events. 7 teens and 1adult were trained as Food & Fitness Ambassadors. An additional 14 previously trained Food & Fitness Ambassadors assisted with the implementation of the program by providing input in the planning process of the state-wide program and worked with county 4-H staff to coordinate GMGH Family Fun Events in their counties.

-A CD was developed with the materials needed to coordinate a Get Moving - Get Healthy Family Fun Events. The CD included instructions on how to run an event, promotional flyers, a newspaper ad, a newspaper article, evaluations, a family goal setting sheet, and a family goals calendar.

-Nine counties coordinated a total of 19 Get Moving - Get Healthy Family Fun Events.

The GMGH Family Fun Events were attended by:
513 youth
361 adults

Based on a pre- and post-test assessment of participants, the following results were achieved. (pre-test n=172, post-test n=156).

*Participants' understanding of the sizes of portions was measured in their ability to correctly identify the object equal in size to one cup.
Pre-Test: Yes - 82 / 48%
Post-Test: Yes - 132 / 84.6
Change: 36.7

*Participants' knowledge of the importance of physical activity was measured in their ability to correctly identify the amount of exercise that youth need daily.
Pre-Test (n=172) Post-Test (n=156)

Pretest: Yes - 111 / 64.5%
Postest: Yes - 108 / 96.2%
Change: 4.7

*The following are the increases in the participant's ability to correctly identify foods in each food group of MyPyramid. (The number is the average number of foods correctly identified in each food group, with 4 being the highest number correct.)

Food Group
Pretest (No) vs. Posttest (No)
Fruit: 3.9/97.2% vs. 3.9/98.1% = Change 0.8%
Vegetable: 3.5/86.8% vs. 3.6/90.7%=Change 3.9%
Meat & Bean: 3.0/75.7% vs. 3.3/82.2%=Change6.5%
Milk: 3.9/97.5% vs. 3.9/98.7%=Change 1.2%
Grain: 3.4/85.8% vs. 3.7/92.9%=Change 7.2%

In addition, participants indicated that as a result of the program:
Post-Test
Yes
. . . I will do something new or different. 151 / 96.8%
. . . I will change the way I think, act or behave. 143/91.7%
. . . I plan to use or share what I learned. 141/90.4

Because of the format of the events, 1/3 of the participating families actually completed the family goal sheets. The following is a list of the top goals selected by families.
(n=96) %
Drink at least 2 glasses/bottles of water a day. 34.4

Spend at least 1 hour a day being active. 34.4
Snack on healthier foods and less on junk food and sweets. 29.1
Eat at least a total of 5 fruits and vegetables a day. 27.0
Eat a healthy breakfast. 26.0
Try a new fruit or vegetable. 26.0
The follow-up survey was sent at least 6 weeks after participation in the program. The follow-up survey had a 16.6% return rate.

75% of the participants responding to the follow-up survey indicated their family had done well at meeting their goals.

Participants responding to the follow-up survey indicated the most useful information presented at the GHGH Family Fun Event was as follows:

Amount of sugar in soda and other beverages 31.2
Appropriate portion sizes 25.0
How to read food labels 18.8

Participants responding to the follow-up survey indicated increases in the following family activities:

Eating more meals together (Another 21% already ate meals together as a family) 35.7%
Cooking together 14.2%
Food shopping together 14.2%
Doing physical activities together 7.1%

Participants responding to the follow-up survey indicated the following changes in health after attending the GH

4. Associated Knowledge Areas

KA Code	Knowledge Area
724	Healthy Lifestyle
703	Nutrition Education and Behavior

Outcome #3

1. Outcome Measures

Short Term - Individuals gain awareness, knowledge, skills related to:
- Attitudes about healthy eating for adults/youth
- Healthy food choices for adults/youth
- Selection of healthy foods for adults/youth
-Benefits of physical activity, (reduced overweight and obesity, reduced risk of diabetes, heart disease and cancer)
-Physical activity recommendations for health for adults/youth
-RCRE
-Identify factors that promote excessive weight gain as well as protect against childhood obesity
-Understand the molecular mechanisms of lipid transport in the intestinal cell
- Demonstrate the affects of calcium absorption and bone mass by weight loss

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Improving Nutrition, Food Safety, and Health of New Jersey Families.

According to the USDA Food Guide Pyramid and the Dietary Guidelines for Americans, individuals need to choose a diet low in fat, saturated fat, and cholesterol and high in whole grains, fruits and vegetables. American diets normally consist of too much fat and too little grains, fruits and vegetables. Americans have become a sedentary nation with modern conveniences and technology being responsible in part. Childhood obesity is increasing and over weight children are showing the same risk factors as overweight adults. In addition, food must be handled and prepared properly in order to prevent food borne illnesses. Research shows that poor personal hygiene is a contributing factor in many food borne disease outbreaks. Although government regulations help to make our food supply safe, the consumer has the final responsibility to handle food safely. Nutritious food choices and safe food handling add to healthier lifestyles. Efforts in nutrition education and food safety are necessary to help consumers to make wise food related decisions for themselves and their families.

What has been done

Since the inception of the program in 2003, FCHS educators have planned and implemented Children's Health Summit - Fighting Back Against Childhood Obseity in nine counties. These Summits are 6-hour intensive conferences for professionals who work with and care about children.

Children's Health Summits were designed to:
* Raise awareness of the scope and severity of the childhood obesity epidemic facing today's society;
* Present the latest research findings from a variety of sources; Increase professionals' knowledge on the topic;
* Identify strategies for affecting change;
* Provide attendees with educational materials for use with professional and lay clientele;
* Organize and facilitate local-level partnerships, called Building Healthy Kids Coalitions, that will stay in place after the Summits conclude.

FCHS has reached more than 1200 school, health, and social service professionals in the causes, consequences, and solutions surrounding childhood obesity. Additional Summits are planned for 2008.

2. Media coverage
Children's Health Summits generated local and regional press coverage. Newspaper, radio and television coverage helped to heighten public awareness and extend the message about childhood obesity to a broader audience

School professionals, nurses, dieticians, parents, health care providers, school food service have been very satisfied with the program. Some of the 2007 written participant comments included, "I will use this information in teaching new parents classes. Plus continue to use this information with my three boys." And "I work for resource and referral agency and plan to provide this information to them." "I plan to team with health teachers to provide quarterly family nutrition nights." "I plan to hold an awareness health fair". "I plan to exercise."

Results

Evaluations document the following:
Behavior changes reported:

* 91% of participants surveyed reported a better understanding of obesity causes;
* 92% noted a better understanding of physical and emotional health consequences;
* 88% reported a better understanding of portion sizes;
* 89% noted a better understanding of the benefits of physical activity.

Actions as a result of participation:
94% of Summit attendees agreed to share information from the conference with at least one other person;
73% will encourage parents, youth group leaders and other adults to serve healthy snacks at meetings and events.
88% will encourage children to eat a nutritious diet;
61% will schedule family meals weekly.
80% agreed to set a good example for children, in terms of eating habits and physical activity.

Participants self-reported a commitment to one or more of the following behaviors:

* eat a healthy breakfast,
* help children find other ways besides food to handle set backs or successes,
* play and be physically active with children,
* select standard food portions instead of super-sized ones,
* teach children to accept all body shapes and sizes;
* let children know that they are loved no matter what;
* recognize children for their positive qualities, strengths and abilities instead of their physical appearance.

As a result of the Summits, additional community partnerships have developed in 2007. Some of the partners have included Shop-Rite Foods, Morristown Memorial Hospital, College of St. Elizabeth, Horizon Blue Cross Blue Shield of New Jersey, Whole Foods Market, Kings Super Market, American Cancer Society, NJ Department of Health Senior Services, NJ Dept. of Agriculture, NJ. Dept of Education.

4. Associated Knowledge Areas

KA Code	Knowledge Area
724	Healthy Lifestyle
703	Nutrition Education and Behavior

Outcome #4

1. Outcome Measures

Short Term: Individuals gain awareness, knowledge, skills related to:
- Attitudes about healthy eating for adults/youth
- Healthy food choices for adults/youth
- Selection of healthy foods for adults/youth
-Benefits of physical activity, (reduced overweight and obesity, reduced risk of diabetes, heart disease and cancer)
-Physical activity recommendations for health for adults/youth
-RCRE
-Identify factors that promote excessive weight gain as well as protect against childhood obesity
-Understand the molecular mechanisms of lipid transport in the intestinal cell
- Demonstrate the affects of calcium absorption and bone mass by weight loss

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

School Wellness

A School Wellness program has been offered to schools and community groups in New Jersey by NJ Department of Agriculture staff and by the FCHS Department to assist schools (staff and parents) and families to: (1) understand the nutrition education goals that are part of the NJ School Wellness legislation (2) to understand the physical activity goals that are part of the legislation (3) to understand the nutrition standards that are part of the school wellness (4) to understand the importance of the local school wellness committee and their impact on compliance of school wellness policies (5) to understand the role of school food service, teachers, administrators and parents in developing and implementing the NJ School Wellness policy.

What has been done

A total of 116 school educators and staff received training on school wellness in 2007.

Results

93% of attendees felt the School Wellness program gave them new information to assist them in establishing and implementing the school wellness policy in their district.

Evaluation data from teachers, administrators and school food service personnel revealed that:
93% will offer their expertise in participation on the wellness committee to implement their school's policy
71% had no knowledge of current school wellness committee or policy
87% will support the implementation of nutrition & activity in their schools and the school wellness policy in their district
93% will assist in developing a school wellness policy that meets the needs of their students
92% will assist in developing a staff wellness policy in their schools

116 participants in these programs requested the following additional information to implement their school wellness policies:
* How to get administrative approval for FCS teacher involvement on school wellness committees
* How to develop a school wellness policy program for students and parents so they understand the school policy
* Available lessons for getting youth to consume more fruit, vegetables, low-fat dairy and whole grains along with activities to help youth increase their level of fitness
* Train the trainer programs for staff wellness
* How to work with school food service to improve fruit, vegetable, low-fat milk and whole grain intake

4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior
724	Healthy Lifestyle

Outcome #5

1. Outcome Measures

Short Term- Individuals gain awareness, knowledge, skills related to:
- Attitudes about healthy eating for adults/youth
- Healthy food choices for adults/youth
- Selection of healthy foods for adults/youth
-Benefits of physical activity, (reduced overweight and obesity, reduced risk of diabetes, heart disease and cancer)
-Physical activity recommendations for health for adults/youth
-RCRE
-Identify factors that promote excessive weight gain as well as protect against childhood obesity
-Understand the molecular mechanisms of lipid transport in the intestinal cell
- Demonstrate the affects of calcium absorption and bone mass by weight loss

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Small Steps to Health & Wealth

Many Americans are experiencing significant problems related to their health such as diabetes and obesity; or their personal finance situation, such as credit problems, lack of savings and low savings or in both areas. The research shows that health and money troubles generally develop gradually and take time to address. Financial worries negatively affect health and poor health negatively affect one's economic well being. Lack of limits causes problems and restrictions help avoid them; drastic solutions to problems, such as bankruptcy and liposuction, can have serious consequences; a lot of people expect quick fixes to their problems and are susceptible to fraudulent health and financial claims.

Small Steps to Health and Wealth (SSHW) is a program designed to motivate participants to improve both their health and their finances. Consisting of 38 PowerPoint slides, a Wellness Wheel handout, and a Small Steps to Health and Wealth Planning Worksheet, the program encourages participants to set a health goal and/or a wealth goal and take action to achieve their goals by identifying small progress steps. The program consists of two main sections: a discussion of 20 similarities between health and personal finance issues and 10 suggested behavior change strategies that can be applied to either area of life. The impact of health on finances and finances on health is also explored. The program concludes with a discussion of seven key health and wealth success factors: attitude, automation, awareness/knowledge, control, environment, goals, and time. Participants are encouraged to share their successes.

What has been done

Two power point programs, a journal article, several Visions articles and related to the "small steps" concept and a book "Small Steps to Health & Wealth" have been written on the topic. A web page for national data collection has been established as part of the University of Arizona website. USDA/CSREES has supported the program and book for national use. A Small Steps walking program was launched for six weeks in the Spring of 2007 with 125 participants.

Ten "Small Steps to Health and Wealth" seminars were presented to Morris County groups in 2007. The class illustrates 25 behavior change strategies that can be applied to improve a person's health as well as his/her finances. Participants were encouraged to adopt no more than three to four strategies to insure success in maintaining new habits. It was the most requested program by county organizations.

Results

Outcomes/Impacts of the Small Steps to Health & Wealth Challenge Pilot Test:

* 51 of 125 SSHW Challenge participants (41%) completed an online survey

* Participants rated their experience with the SSHW Challenge as follows:

o 59%: Very positive and motivational
o 41%: Somewhat positive and motivational

* Participants reported the following positive behavior changes as a result of the SSHW Challenge::

o 65% ate healthier foods
o 63% increased daily physical activity
o 43% saved money (individual savings of $20 to $1,000 was reported)
o 43% improved spending habits
o 29% lost weight (individual weight loss of 1 to 14 pounds over 6 weeks was reported)
o 20% made other changes (e.g., increased awareness, kick started changes, joined a gym)

* The most frequently reported "best features" of the SSHW Challenge included:

Increased accountability, the group motivation and support of being part of a team, the daily checklist and tracking of activities, wearing a pedometer, increased physical activity, camaraderie of friends and colleagues, a personal analysis of daily eating and spending habits, a manageable number of tasks, the ability to participate in the Challenge from a distance, and fun with and support from teammates.

* The most frequently reported suggestions to improve the SSHW Challenge included:

Web-based reporting of scores, eliminating "saving pocket change" as an activity, provide more references for health and financial articles, have a sliding scale of points for number of steps walked instead of just wearing a pedometer, make all activities very specific (e.g., reduce calories and reduce spending are too vague), and revitalize teams halfway through the Challenge.

* The following suggestions and comments were included in survey responses:
o Would do again.
o I really enjoyed participating and would participate again if you had another challenge.
o Enjoyed the experience and the guidance given.
o Great activity! Should be required for all college students as well.
o It would be easier to have online tracking of our steps and our goals.
o Neat concept!
o Thanks again for a great program...I look forward to the next one!

As a result of this class, what action(s) do you plan to take in the future? (Check all that apply) Results from 70 participants on 1/10/07--Fanwood Woman's Club for 15 participants; on 4/21/07 at Bergen County Education Association for 45 educators and 10/10/07 at the Hillside Public Library for 10 participants.

75% Set one or more specific written health or financial goals
67% Decrease portion sizes of foods eaten
47% Decrease discretionary household spending
58% Track current eating and/or spending habits
77% Increase daily exercise
27% Compare current health and finances to expert recommendations (e.g., BMI, debt ratios)
27% "Automate" a health or financial behavior (e.g., automated investment plans)
55% Better control intake and outgo of food (eating/exercising) and/or money (earning/spending)
30% Read or attend seminars on health or finance topics
62% Periodically monitor progress toward health or finance goals

4. Associated Knowledge Areas

KA Code	Knowledge Area

724	Healthy Lifestyle
703	Nutrition Education and Behavior

Outcome #6

1. Outcome Measures

Short Term--Individuals gain awareness, knowledge, skills related to:
- Attitudes about healthy eating for adults/youth
- Healthy food choices for adults/youth
- Selection of healthy foods for adults/youth
-Benefits of physical activity, (reduced overweight and obesity, reduced risk of diabetes, heart disease and cancer)
-Physical activity recommendations for health for adults/youth
-RCRE
-Identify factors that promote excessive weight gain as well as protect against childhood obesity
-Understand the molecular mechanisms of lipid transport in the intestinal cell
- Demonstrate the affects of calcium absorption and bone mass by weight loss

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Drug Therapies to Treat Obesity

Obesity in the United States has risen at an epidemic rate during the past 20 years, a condition affecting about one-third of American adults, according to the Centers for Disease Control and Prevention. One of the national health objectives for the year 2010 is to reduce the prevalence of obesity among adults to less than 15 percent. Obesity is widely prevalent in the US and dietary fat is the major calorie generating nutrient in our diets. However, little is known about the process of dietary fat uptake or how certain enzymes such as lipin affect fat metabolism, where excess lipin promotes extra body fat.

What has been done

One research group investigated the mechanism and regulation of intestinal fatty acids and monoacylglycerol lipase (iMGL) transport and metabolism. Transgenic mice that overexpressed iMGL in the small intestine were used to elucidate the role of the enzyme in fat metabolism. For lipin research, a yeast model was used to show that lipin (phosphatidic acid phosphatase or PAP) was required for the formation of fat trigylcerides. They then decoded the amino acid sequence for the PAP enzyme from yeast, and confirmed its correspondence with mammalian lipin.

Results

This research provides new information on how certain enzymes regulate fat uptake in the body provide new targets for drug therapies to prevent or treat obesity. The transgenic mice ate much more and had decreased energy expenditure as compared to normal mice. Based on the research, iMGL has a role in whole body energy balance, possibly via regulation of food intake. Also, iMGL, may play a functional role not only in lipid synthesis but also in the regulation of appetite and energy expenditure.
The breakthrough for lipin research was the isolation of the PAP enzyme from yeast that corresponds in form to lipin in mammals and the fact that yeast cells lacking the enzyme exhibited a 90 percent reduction in the yeasts version of fat loss. Without PAP enzyme, the ability to lose fat was practically extinguished, highlighting the role of this lipin enzyme in fat loss, and adding a key process for for lipin's role in fat metabolism. Combined with the information from the iMGL work, there are new substances and pathways to target new pharmaceuticals and other therapies for treatment and prevention of obesity.

4. Associated Knowledge Areas

KA Code	Knowledge Area
702	Requirements and Function of Nutrients and Other Food Components
701	Nutrient Composition of Food

Outcome #7

1. Outcome Measures

Short Term: Individuals gain awareness, knowledge, skills related to:
- Attitudes about healthy eating for adults/youth
- Healthy food choices for adults/youth
- Selection of healthy foods for adults/youth
-Benefits of physical activity, (reduced overweight and obesity, reduced risk of diabetes, heart disease and cancer)
-Physical activity recommendations for health for adults/youth
-RCRE
-Identify factors that promote excessive weight gain as well as protect against childhood obesity
-Understand the molecular mechanisms of lipid transport in the intestinal cell
- Demonstrate the affects of calcium absorption and bone mass by weight loss.

2. Associated Institution Types

•1862 Extension
•1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Health Literacy

Health literacy is usually considered to be a problem for the public, whereas only 12% of the adult population achieves proficient health literacy. Low health literacy is linked with poor health outcomes, higher hospitalization and less frequent use of preventative services. However, providers of health care and health information often exhibit poor health literacy as well; for example, they may communicate in linguistically and culturally inappropriate manners. This work creates a positive impact by bringing those often hidden barriers to the attention of public health professionals, academics, health communicators, and medical practitioners and supplying them with a set of skills they can put into practice in their daily work to ultimately protect and improve public health.

What has been done

In order to address the problem of low health literacy, faculty at NJAES are reviewing the existing literature and practices to identify best practices and program guidelines related to health literacy, as well as conducting an active research program into the determinants and appropriate responses to low health literacy. By working with partners in government and non-government organizations, they can help increase awareness of health literacy among public health and medical professionals, and ultimately, improve ability of public health and medical professions to clearly and effectively communicate. In New Jersey, a network of individuals is being created, working across the state to improve health literacy skills of health and related professionals within the state to improve health literacy skills of health and related professionals within the state. Also, they are identifying and working with national and international partners and venues for outreach and interventions. Through a series of seminars, training sessions, grand rounds, and any and other training and outreach opportunities, increased awareness of health literacy will help both the general public and public health professionals bridge communication and knowledge gaps.

Results

The training events produced increased awareness and capacity in individuals to address their own health literacy. Two-thirds of the participants said that the trainings increased their understanding "very much," and 90% stated that they can use the information and 80% said that they will take a specific action in the futre. By increasing awareness, these health literacy solutions can solve many of the communication problems between people and the health service sectors, and lead to increased health literacy and increased overall health.

4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought,weather extremes,etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programatic Challenges
- Populations changes (immigration,new cultural groupings,etc.)

Brief Explanation

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- After Only (post program)
- Retrospective (post program)
- Before-After (before and after program)
- Time series (multiple points before and after program)
- Comparisons between program participants (individuals,group,organizations) and non-participants
- Comparisons between different groups of individuals or program participants experiencing different levels of program intensity.
- Comparison between locales where the program operates and sites without program intervention

Evaluation Results

Evaluation results are unique to each program. See Qualitative Outcome Statements.

Key Items of Evaluation

Program #3

V(A). Planned Program (Summary)

1. Name of the Planned Program

Indoor Air Quality

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
723	Hazards to Human Health and Safety	50%		50%	
804	Human Environmental Issues Concerning Apparel, Textiles, a	50%		50%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2007	Extension		Research	
	1862	1890	1862	1890
Plan	3.0	0.0	2.0	0.0
Actual	0.0	0.0	0.6	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
0	0	20308	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	56127	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	46626	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

- Conduct quality & quantity of data on statewide asthma prevalence
- Organize network for developing and assessing asthma prevention and intervention efforts
- Provide in service training on air pollutants
- Provide educational programs for consumers
- Train public health workforce and healthcare providers on the dangers of environmental hazards of the home environment
- Promote and partner with initiative to improve numbers of children screened for elevated blood lead

2. Brief description of the target audience

- Residents/Families
- Healthcare and Child Care Providers
- Healthcare professionals
- Policymakers
- Profit/Non-Profit organizations
- Businesses
- Schools
- Faith Communities
- Home Owners
- Landlords/Tenants
- Housing Authority
- Health Agencies
- State/Local Government
- Building/Housing Inspectors
- Local Health Departments
- Resident's homes "identified as at risk"
- Environmental Association
- Media
- Agencies that collect data

V(E). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	**Target**	**Target**	**Target**	**Target**
Plan	2000	20000	0	0
2007	0	0	0	0

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year	Target
Plan:	0
2007 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan			
2007	0	5	5

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Cooperative Extension has eliminated this program. Research will continue to conduct applied and basic research.

Year	Target	Actual
2007	{No Data Entered}	0

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O No.	Outcome Name
1	Short Term Increased recognition of environmental respiratory disease hazards in the residential dwelling service (realtors, lenders, inspectors, construction trades) Increased awareness of policies related to indoor air Established a comprehensive asthma surveillance program Individuals have fewer emergency room and acute care visits related to asthma and other respiratory disease Health professionals have increased continuing professional development on environmental respiratory disease Families with children at-risk for lead poisoning have their children tested Public health work force and healthcare providers have knowledge of environmental hazards in the home
2	Medium Term Increased number of buildings constructed to meet indoor air quality guidelines Increased awareness of environmental respiratory disease among communities, healthcare providers and individuals Increased access to knowledgeable healthcare providers and information sources Increased use of uniform case definition and diagnostic protocols for respiratory disease Increased ability to respond to indoor air problems by public health agencies Increased number of homes at-risk that have participated in the NJ “Lead-Safe” or “Lead-Free” Registry
3	Long Term Residents have reduced exposure to environmental determinants that contribute to respiratory disease Residents with respiratory disease successfully manage their disease in accordance with recommended practices Accurate diagnosis of environmental respiratory disease New construction meets the criteria to have good indoor air quality The best available technology is used to remediate homes for lead or radon

Outcome #1

1. Outcome Measures

Short Term

Increased recognition of environmental respiratory disease hazards in the residential dwelling service (realtors, lenders, inspectors, construction trades)
Increased awareness of policies related to indoor air
Established a comprehensive asthma surveillance program
Individuals have fewer emergency room and acute care visits related to asthma and other respiratory disease
Health professionals have increased continuing professional development on environmental respiratory disease
Families with children at-risk for lead poisoning have their children tested
Public health work force and healthcare providers have knowledge of environmental hazards in the home

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	2000	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Indoor Air Quality

According to a recent estimate from EPA, Americans spend 90% of their time indoors, increasing risk to indoor air pollutant exposure and subsequent illness such as asthma or sick building syndrome. NJAES researchers have been creating models to measure indoor, outdoor and personal exposure to air particulate matter to provide evidence-based information for public health assessment and regulatory guidance. These models are important so that public health officials and regulatory agencies can more affectively assess the exposure to air pollutants and create strategies to reduce exposure to these pollutants. In addition to improved models, improving the air-cleaning process of biofiltration, which traditionally was used to remove odors, but recent research at NJAES demonstrated its effectiveness at removing several types of air pollutants, such as volatile organic compounds and ammonia from agriculture production, which is of particular concern according to pollution regulations stated in the Clean Air Act.

What has been done

Researchers analyzed ambient outdoor, residential indoor and personal exposure measurement data to better characterize community exposure to airborne particulate matter of outdoor and indoor origin. Through lab experiments, chemical modeling and collaborative chemical transport modeling, has increased the understanding of the atmospheric formation of organic particulate matter through cloud processing.

Studies were performed to increase the range of contaminants for which biofiltration can be used, especially for ammonia. Also, research on the effectiveness of rinsing of biofilters for removal of inorganic nitrogen compounds was completed.

Results

It is now understood that a large majority of residential indoor airborne particulate matter is organic. Also, penetration of outdoor particles into indoor environments and the persistence of these particles in indoor spaces generate exposure errors that warrant further consideration in epidemiological studies understanding the associations between air pollution and health. To remedy indoor air pollution, biofiltration has many advantages over more traditional physical or chemical air filtration systems. Biofiltration requires only ,½ to ,¼ the cost to operate versus physical or chemical filtration of air pollution, and has the advantage of being able to clean different types of air pollutants at a time, with little to no waste stream.

4. Associated Knowledge Areas

KA Code	Knowledge Area
804	Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures
723	Hazards to Human Health and Safety

Outcome #2

1. Outcome Measures

Medium Term

Increased number of buildings constructed to meet indoor air quality guidelines

Increased awareness of environmental respiratory disease among communities, healthcare providers and individuals

Increased access to knowledgeable healthcare providers and information sources

Increased use of uniform case definition and diagnostic protocols for respiratory disease

Increased ability to respond to indoor air problems by public health agencies

Increased number of homes at-risk that have participated in the NJ “Lead-Safe” or “Lead-Free” Registry

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	3000	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area

804	Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures
723	Hazards to Human Health and Safety

Outcome #3

1. Outcome Measures

Long Term

Residents have reduced exposure to environmental determinants that contribute to respiratory disease

Residents with respiratory disease successfully manage their disease in accordance with recommended practices

Accurate diagnosis of environmental respiratory disease

New construction meets the criteria to have good indoor air quality

The best available technology is used to remediate homes for lead or radon

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	3000	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
723	Hazards to Human Health and Safety
804	Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought,weather extremes,etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programatic Challenges
- Populations changes (immigration,new cultural groupings,etc.)

Brief Explanation

Due to the retirement of Extension Specialist, Cooperative Extension does not have the desired expertise to give priority attention to the planned program area. NJAES research efforts continue.

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- Before-After (before and after program)
- During (during program)
- Time series (multiple points before and after program)
- Comparisons between program participants (individuals,group,organizations) and non-participants
- Comparisons between different groups of individuals or program participants experiencing different levels of program intensity.
- Comparison between locales where the program operates and sites without program intervention

Evaluation Results

Evaluation results are unique to each program. See Qualitative Outcome Statements.

Key Items of Evaluation

Program #4

V(A). Planned Program (Summary)

1. Name of the Planned Program

4-H Youth Development

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
806	Youth Development	100%		100%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2007	Extension		Research	
	1862	1890	1862	1890
Plan	30.0	0.0	1.0	0.0
Actual	19.0	0.0	1.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
146422	0	11748	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
536698	0	110834	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
196881	0	2643	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Positive Youth Development:
- Employ Essential Elements (belonging, independence, mastery and generosity) as the basis for life skill development and related workforce development skills.
- Utilize Experiential Education Model (Experience, Share, Process, Generalize, Apply)

Provide opportunities for youth to:
- feel and believe that they are cared about by others (Attachment, Belonging, Connection)
- feel and believe they are capable and successful (Achievement, Mastery, Competence)
- know they are able to influence people and events (Autonomy, Power, Confidence)
- practice helping others through youth's own generosity (Altruism, Purpose, Contribution)

Subject matter:
(USDA/CSREES Mission Mandates)
Science, Engineering, Technology (includes: science literacy, animal science, plant science, environmental science, life sciences, etc) Citizenship (includes youth engagement, community youth development, community service, character development, civic engagement, etc) Healthy Lifestyles (includes chemical health, mental and emotional health, foods & nutrition, physical health and safety, etc)

2. Brief description of the target audience

- School Age youth (K – 13, one year out of high school) and their parents
- 4-H Volunteers (adult and youth)
- Teachers/Educators/other youth development educators
- School Age Child Care Providers
- College Students (interns, collegiate 4-H)
- Other Extension Professionals and university partners
- Communities: stakeholders and non-profit, social service, government agencies
- Under-served and under-represented audiences

Delivery modes:

- 4-H Clubs and related activities
- 4-H Afterschool (clubs and short-term programs)
- 4-H School Enrichment
- 4-H Special Interest
- 4-H Camping (day camps and overnight camping)
- 4-H Mentoring and Individual Study

V(E). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
Plan	2200	10000	45000	20000
2007	2319	8850	50391	32700

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year	Target
Plan:	0
2007 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan			
2007	5	0	5

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- 893 organized 4-H Clubs; 1098 4-H special interest/short-term programs; 321 camping programs; 3692 4-H school enrichmen

Year	Target	Actual
2007	{No Data Entered}	6086

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O No.	Outcome Name
1	Short Term Youth increase awareness, knowledge, attitudes, and skills related to essential elements, workforce development, life skill development, and relevant subject matter. Volunteers increase knowledge and awareness of practices fostering positive youth development, including youth/adult partnerships. Youth development professionals and stakeholders increase awareness and knowledge of problems and solutions supporting positive youth development, including: · policies that need to be addressed. · community resources and support.
2	Medium Term Youth apply knowledge, attitudes, skills, and behaviors needed to become competent, caring and contributing citizens by: · taking on leadership roles in their youth organizations and schools. · working in partnership with adults in a variety of settings. Youth and adults demonstrate effective partnerships through increased youth participation on advisory committees and other governing bodies. Volunteers and youth development professionals apply practices fostering positive youth development.
3	Long Term Youth demonstrate mastery and competencies needed to become engaged citizens by · assuming leadership positions in communities. · developing and implementing action plans to address community needs. · becoming productive members of the workforce. 4-H youth are engaged partners in decision making regarding RCE programming including but not limited to 4-Hyouth development programming. 4-H alumni and volunteers become engaged citizens by assuming leadership positions in communities. Youth development professionals and stakeholders influence decision makers in policy development related to youth development needs and issues.
4	Short Term - Youth increase awareness, knowledge, attitudes, and skills related to essential elements, workforce development, life skill development, and relevant subject matter. Volunteers increase knowledge and awareness of practices fostering positive youth development, including youth/adult partnerships. Youth development professionals and stakeholders increase awareness and knowledge of problems and solutions supporting positive youth development, including: - policies that need to be addressed. - community resources and support.
5	Short Term - Youth increase awareness, knowledge, attitudes, and skills related to essential elements, workforce development, life skill development, and relevant subject matter. Volunteers increase knowledge and awareness of practices fostering positive youth development, including youth/adult partnerships. Youth development professionals and stakeholders increase awareness and knowledge of problems and solutions supporting positive youth development, including policies that need to be addressed, community resources and support.

6	Short Term - Youth increase awareness, knowledge, attitudes, and skills related to essential elements, workforce development, life skill development, and relevant subject matter. Volunteers increase knowledge and awareness of practices fostering positive youth development, including youth/adult partnerships. Youth development professionals and stakeholders increase awareness and knowledge of problems and solutions supporting positive youth development, including: - policies that need to be addressed. - Community resources and support.
7	Long Term - Youth demonstrate mastery and competencies needed to become engaged citizens by - assuming leadership positions in communities. - developing and implementing action plans to address community needs. - becoming prodcutive members of the workforce. 4-H youth are engaged partners in decision making regarding RCE programming including but not limited to 4-H youth development programming. 4-H alumni and volunteers become engaged citizens by assuming leadership positions in communities. Youth development professionals and stakeholders influence decision makers in policy development related to youth development needs and issues.
8	Youth Long Term - Youth demonstrate mastery and competencies needed to become engaged citizens by -assuming leadership positions in communities. - developing and implementing action plans to address community needs. -becoming productive members of the workforce. 4-H youth are engaged partners in decision making regarding RCE programming including but not limited to 4-H youth development programming. 4-H alumni and volunteers become engaged citizens by assuming leadership positions in communities. Youth development professionals and stakeholders influence decision makers in policy development related to youth development needs and issues.
9	Long Term - Youth demonstrates mastery and competencies needed to become engaged ctizens by: assuming leadership positions in communities; developing and implementing action plans to address community needs; becoming productive members of the workforce. 4-H youth are engaged partners in decision making regarding RCE programming including but not limited to 4-H youth development programming. 4-H alumni and volunteers become engaged citizens by assuming leadership positions in communitities. Youth development professionals and stakeholders influence decision makers in policy development related to youth development needs and issues.

Outcome #1

1. Outcome Measures

Short Term

Youth increase awareness, knowledge, attitudes, and skills related to essential elements, workforce development, life skill development, and relevant subject matter.

Volunteers increase knowledge and awareness of practices fostering positive youth development, including youth/adult partnerships.

Youth development professionals and stakeholders increase awareness and knowledge of problems and solutions supporting positive youth development, including:

· policies that need to be addressed.

· community resources and support.

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	30000	50391

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #2

1. Outcome Measures

Medium Term

Youth apply knowledge, attitudes, skills, and behaviors needed to become competent, caring and contributing citizens by:

· taking on leadership roles in their youth organizations and schools.

· working in partnership with adults in a variety of settings.

Youth and adults demonstrate effective partnerships through increased youth participation on advisory committees and other governing bodies.

Volunteers and youth development professionals apply practices fostering positive youth development.

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	35000	50391

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #3

1. Outcome Measures

Long Term
Youth demonstrate mastery and competencies needed to become engaged citizens by
· assuming leadership positions in communities.
· developing and implementing action plans to address community needs.
· becoming productive members of the workforce.

4-H youth are engaged partners in decision making regarding RCE programming including but not limited to 4-Hyouth development programming.

4-H alumni and volunteers become engaged citizens by assuming leadership positions in communities.

Youth development professionals and stakeholders influence decision makers in policy development related to youth development needs and issues.

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	38000	50391

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Operation Military Kids

Realities of the "war on terror" have contributed to a major change in the military culture of the National Guard and Army Reserve. Deployment of these soldiers as an army providing back up to active duty soldiers has changed to deployment as routine expectation. As a result, many youth and families have been suddenly confronted with challenges they did not anticipate.

Operation: Military Kids (OMK) is a national collaborative effort being implemented in many states to address these challenges. New Jersey OMK has focused on teens and expansion of leadership opportunities for them.

What has been done

New Jersey has expanded military kids to include:
- OMK Teen Speakers' Bureau
- Hero Packs - Care Packages for Military Children
- RSG! Trainings - Community Awareness Briefings
- Mobile Technology Lab - Connecting with Technology
- Project Young Heroes
- Teen Leadership Camp Out

NJ Teen Leadership Camp Out was a 3-day event for a diverse group of teens from NJ and NY, including 4-H members and military youth. Youth actively participated in a variety of teambuilding and leadership development workshops and projects. Objectives of the program were to:
- Increase teens' understanding of leadership and the connection to life skill development.
- Strengthen leadership skills in teens including teamwork, problem solving, cooperation, and communication.

OMK Project Young Hereos - In an effort to develop connections between military and non-military youth, youth shared their experiences with deployment of a parent. The impact of their stories of loneliness, sadness, worry, and isolation from their peers motivated a group of 12 teen leaders to initiate Young Heros. This is a youth service project designed to respond to the needs of youth impacted by military deployment. The goals of the Young Heroes project were to:
- Understand the unique stresses experienced by youth and their families before, during, and after deployment.
- Enhanced skill development in media and technology, public speaking, team building, and working effectiely with adults.
- Design and produce a video/DVD featuring youth who have experienced the deployment of a parent.
- Package a tool kit of hands-on educational materials to assist presenters.
- Raise awareness of the impact of deployment on youth and mobilize communitites to provide needed support.

Speak Out Military Kids (SOMK) is a program designed for teens interested in increasing community awareness about the unique issues facing children with deployed parents. Teen participants served as a speakers' bureau for the OMK initiative. Teens received training on the stages of deployment, the effects of deployment on the family unit and public speaking skills. Participants were encouraged to create and utilize media technologies to assist their presentations to schools and community groups.

Hero Packs, care packages filled with age-appropriate items designed to aid youth in coping with their parent's deployment, were assembled by youth and adults volunteers and then distributed to military youth. Hero Pack objectives were to:
- Provide youth with a hands-on opportunity to support military youth by participating in Hero Pack Assembly events.
-Provide information about local support programs for military families.
-Recognize military youth for their sacrifices in having a parent serving our country and to show them that other children support them.

Results

The New Jersey Operation Military Kids program resulted in programs that influenced decision makers in policy development and critical issues impacting youth whose parents were deployed.

The RSG! Trainings engaged communities and facilitated group service projects reaching over 470 youth and adults.

The Teen Leadership Camp Out resulted in teens gaining leadership skills - evaluations documented that:
- 92% will do something new or different.
- 85% have changed the way they think, act, or behave.
- 96% plan to use or share what they learned.
- Participants planned to use what they learned in these settings: 62% when leading other groups; 17% in school; 17% in 4-H club meetings.
- 83% of participants indicated that because of the Leadership Camp Out they believe they can be better leaders.

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #4

1. Outcome Measures

Short Term - Youth increase awareness, knowledge, attitudes, and skills related to essential elements, workforce development, life skill development, and relevant subject matter.

Volunteers increase knowledge and awareness of practices fostering positive youth development, including youth/adult partnerships.

Youth development professionals and stakeholders increase awareness and knowledge of problems and solutions supporting positive youth development, including:
- policies that need to be addressed.
- community resources and support.

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

"Be a Robotics Explorer" 4-H Summer Enrichment Program

School test results show that a large number of youth in New Jersey are not proficient in the areas of math, science and technology. In addition, many boys and girls are afraid or apprehensive about doing science related activities. Given these facts it is important to focus on the National 4-H Initiative of Science, Technology and Engineering by providing educational programs that provide an opportunity for youth to explore and learn about science and technology in a positive, non-threatening, hands-on and fun environment.

What has been done

Sixteen youth in grades 4-7 participated in the week-long "Be a Robotics Explorer" 4-H Summer Enrichment Program. This program, which focused on robotics, featured an opportunity for youth to discover and learn about robotics using age appropriate and fun hands-on activities. Creativity and critical thinking skill development were important aspects of the program as participants worked together to design, build and program a tankbot and robot. The highlight of the week was the Robotics Skill-A-Thon were families of the children who participated in the program were invited to participate in several interactive stations. Through fun, hands-on activities, families worked together to write instructions on how to build a robot; decode messages; build a tankbot; perform robotics math; and program a robot to move. The program participants demonstrated how their robots moved through an obstacle course that they designed and constructed during the week.

Purpose/objectives of the program were:

* To provide an opportunity for youth to learn about technology, robots and computer programming.
* To develop an understanding of robotics.
* To develop creative thinking, problem solving and communication skills.

Results

* Ninety-two percent (92%) of participants indicated that they learned how to build a tankbot on the end-of-program evaluation and 92% indicated that they have the ability to program a robot to make point and non-point turns.
* Sixty-nine percent (69%) of the participants indicated that they learned "A Lot" about how to communicate with others and 62% learned "A Lot" with regard to how to work together and analyze and solve problems.
* Seventy-six percent (76%) of the participants increased their score from pre test to post test by an average of 21%.
* One hundred percent (100%) of the participants indicated that they plan to use or share what they learned.

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #5

1. Outcome Measures

Short Term - Youth increase awareness, knowledge, attitudes, and skills related to essential elements, workforce development, life skill development, and relevant subject matter. Volunteers increase knowledge and awareness of practices fostering positive youth development, including youth/adult partnerships. Youth development professionals and stakeholders increase awareness and knowledge of problems and solutions supporting positive youth development, including policies that need to be addressed, community resources and support.

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Union County 4-H Summer Science Program

Low income children in Union County score significantly lower on science achievement tests than middle and upper income students.

What has been done

For seven weeks each summer, 4-H enriches the summer vacations of children by providing them with science education. This is accomplished by providing science teachers to summer day camps located in the poorer parts of Union County. Approximately 600 children, ages 6 to 12, participated in the program this year.

Results

136 of the children who participated in the 2007 program completed an end-of-program evaluation. The evaluation showed that:
-88% of total said that as a result of being in the 4-H Summer Science Program they can solve a problem better now.
-82% of total said that as a result of being in the 4-H Summer Science Program they can observe things better.
88% of total said that as a result of being in the 4-H Summer Science Program they can do an experiment.
71% of total said that as a result of the 4-H Summer Science Program they like science more than before.
76% of total said that as a result of the 4-H Summer Science Program I would like to learn more about science.
67% of total said they would tell someone what they learned.
35% of total said as a result of the 4-H Summer Science Program they would like to become a scientist someday.

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #6

1. Outcome Measures

Short Term - Youth increase awareness, knowledge, attitudes, and skills related to essential elements, workforce development, life skill development, and relevant subject matter.

Volunteers increase knowledge and awareness of practices fostering positive youth development, including youth/adult partnerships.

Youth development professionals and stakeholders increase awareness and knowledge of problems and solutions supporting positive youth development, including:
- policies that need to be addressed.
- Community resources and support.

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Urban Gardening Education

Atlantic City schools have an average 6.4% drop out rate compared to the state average of 1.8% and a 58.8% graduation rate (state average 88.8%). Proficiency in science (NJASK8) is below the state average, while partial proficiency in these subjects (52.4%) is well above the state average (21%).
Research on gardening suggests a variety of benefits, for both individuals and for communities. Science achievement, positive attitudes toward school and community, and increased life skills development are enhanced through hands-on gardening activities. Young people show positive attitudes toward fruit and vegetable snacks and an improvement in vegetable preference scores after completing activities from a nutrition gardening program. In addition, gardening is one of the most commonly practiced types of exercise and is a recommended form of physical activity.

What has been done

170 youth were involved in 110 hours of gardening education that ran from 12 to 24 weeks depending on the group and the organization partner. Some students were involved in year round indoor gardening activities that complemented their ongoing science lessons. An afterschool 4-H garden club was established and involved in a special school/community garden and community service project and youth from a 21st Century Learning Center program participated in an indoor/outdoor garden project. The special needs high school students expanded their involvement this past year with the establishment of a recognized Horticultural Occupational Therapy Program. These students began with greenhouse gardening and continued through the summer with an outdoor community garden.

Results

Student pre/post and post/post test results indicated overall gains in knowledge and attitudes basic plant science. Results demonstrated significant gains ($p < .05$) for plant needs, plant parts and function, and germination and significant gains ($p < 0.0167$) for the constructs of plant science for plant growth and development, soil, insects and diseases, and vegetables and herbs. Qualitative data for all programs also indicated that the students enjoyed the program, shared what they learned with others, and wanted to participate in more gardening type activities. Consistently over the years, an increase in knowledge and skills in the area of plant science and gardening have been noted over the past years using a variety of pre/post, post/post tests and other evaluation methods - indicating short term objectives have been met. A variety of methods were used during this past, and final, year to document any mid term goals of changing behaviors and attitudes.

Obtaining permission from the principal, students' parents, and 2nd grade teachers, student report cards for all 2nd graders were compared with regards to science grades and other indicators. The 2nd grade class involved with the indoor garden project had 26.32% more A's in the 4th marking period than all other 2nd grade classes and 94.74% of all participating students had a mean 2.25 grade increase from the 1st to 4th marking periods. The teacher noted a 31.58% noticeable improvement in the students' science writing skills and a 27% increase in demonstrated deeper comprehension overall. Only 1 student (.05%) of participating students had discipline problems requiring detention/suspension during the school as compared to 2.7% of all other 2nd grade students. The teacher noted that 2 particular students had a "dramatic attitude change in a positive way" and 78.95% exhibiting more positive behavior in the classroom because of responsibility and ownership of the plants.

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #7

1. Outcome Measures

Long Term - Youth demonstrate mastery and competencies needed to become engaged citizens by
- assuming leadership positions in communities.
- developing and implementing action plans to address community needs.
- becoming prodcutive members of the workforce.

4-H youth are engaged partners in decision making regarding RCE programming including but not limited to 4-H youth development programming.

4-H alumni and volunteers become engaged citizens by assuming leadership positions in communities.

Youth development professionals and stakeholders influence decision makers in policy development related to youth development needs and issues.

Youth

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:
Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The Shotwell 4-H Educational Exhibit Hall

The Sussex County 4-H program addresses the developmental needs of local youth by providing programming that supports positive youth development. The program has grown steadily over the years.

The goal of constructing a 4-H building at the county fairgrounds has been to strengthen the long-term sustainability of the 4-H program in Sussex County. This effort has led 4-H staff and volunteers to become more practiced in strategic planning and development and to increase our ability to assess organizational need and plan accordingly.

What has been done

To accommodate this growth and to anticipate future capacity a volunteer effort was initiated to establish a permanent 4-H building at the Sussex County Fairgrounds (Augusta, NJ).
The building will serve as a showcase for projects of local 4-H clubs during the annual New Jersey State Fair and Sussex County Farm and Horse Show.
In the off-season the building will host 4-H special events and clinics during the off season. (The need for such a venue has been documented for several years.) The New Jersey State Fair coordinates rental of the building by other not-for-profit organizations outside of the annual fair. These rentals serve a community need and provide funds to support the maintenance of the building
A public relations campaign was undertaken by 4-H staff to generate public awareness and attract donors. The building was completed in July in time for the 2007 New Jersey State Fair. A not-for-profit (501-c-3) corporation comprised of 4-H volunteers has been established to oversee and develop building use.

Results

Raising the building has served as a focus for Sussex 4-H clubs in 2007. Fundraising, witnessing the building's construction and using the building for the 2007 Fair has been rewarding to the Sussex 4-H community; the building is a source of pride. Moreover, its completion represents the culmination of years of planning and effort by long time 4-H volunteers and members. This process galvanized the county's 4-H community as volunteers mobilized resources to raise the necessary funds to make this building a reality. The Sussex 4-H community recognizes the Shotwell Building as a resource for current and future 4-H members.
Comments from the 4-H community and visitors to the building have been entirely positive. Many have observed several design features that make the building highly functional and versatile. These include the well ventilated construction and insulation. The finished walls allow the building's use as a venue for formal and informal events.

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #8

1. Outcome Measures

Long Term - Youth demonstrate mastery and competencies needed to become engaged citizens by
-assuming leadership positions in communities.
- developing and implementing action plans to address community needs.
-becoming productive members of the workforce.

4-H youth are engaged partners in decision making regarding RCE programming including but not limited to 4-H youth development programming.

4-H alumni and volunteers become engaged citizens by assuming leadership positions in communities.

Youth development professionals and stakeholders influence decision makers in policy development related to youth development needs and issues.

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Workforce Preparation Programs

The Englewood Department of Recreation is a main employer of Englewood youth during the summer months. The recreation department noted a decrease in applicant preparedness and communication abilities. For this reason, the Recreation Department requested an intensive interview preparation program that would prepare Englewood youth for obtaining a position with the Recreation Department.

What has been done

The goal was to help Englewood youth become more professional job candidates when applying for a position with the Englewood Recreation Department. To accomplish this, the program focused on the following areas:

* Learning how to recognize what the employer is looking for in candidates through research
* Gain a better understanding of individual KSAs and how to align them with a job description
* Be prepared to answer specific and general interview questions
* Learn to prepare for an interview

Results

The goal of the program was accomplished as the Recreation Department indicated that the program was a resounding success. They noted an increase in professionalism, ability to represent oneself in an interview, and use of notes and resumes when interviewing which in the Recreation Departments opinion was directly related to the provided program. They have committed to expand the program for the upcoming year in an effort to build on the success.

All of the program participants were hired by the Recreation Department. The Recreation department noted a definite increase in applicant preparation and professionalism.

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #9

1. Outcome Measures

Long Term - Youth demonstrates mastery and competencies needed to become engaged ctizens by: assuming leadership positions in communities; developing and implementing action plans to address community needs; becoming productive members of the workforce. 4-H youth are engaged partners in decision making regarding RCE programming including but not limited to 4-H youth development programming. 4-H alumni and volunteers become engaged citizens by assuming leadership positions in communitities. Youth development professionals and stakeholders influence decision makers in policy development related to youth development needs and issues.

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Impact of Welfare Reform Policies

Welfare reform as implemented through the Personal Responsibility & Work Opportunity Reconciliation Act (PRWORA) has had a tremendous impact on poor women and their children throughout the United States. While a great deal has been written about welfare reform effects on urban populations, the impact on rural poor has been examined relatively infrequently. This project will help fill in the knowledge gaps and provide much needed evidence-based information to address welfare reform policies and the effects on rural and poor women and children.

What has been done

An analysis of the interactions among public assistance and informal social supports, community context, and individual and family characteristics and their relation to the functioning and well-being of rural low income families with children over three years time is being performed. Also, the project examines how families have adapted to policy and economic changes to achieve self-sufficiency (household adaptive strategies and well bing that are associated with economic, food security, family functioning and policy.)

In addition, the researcher examined the relative fficacy of labor force attachment, human capital investment and combined strategies used by workers to facilitate the movement of poor recipients from welfare to work. In another research effort, the investigator evaluated how welfare reform was influencing child fostering (children's living situations defined by the absence of both biological parents) in welfare families.

Results

The social impact of this research evidenced itself in state and federal legislation that has sought to limit or repeal family cap laws. These bills include US House of Representative HR-4628, NJ Assembly Bill (A2398) NJ Senate Bills (s1298). Also, the PI published a book on findings from this research: Family Caps, Abortions, and Women of Color, Oxford University Press, in August 2007.

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought,weather extremes,etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programatic Challenges
- Populations changes (immigration,new cultural groupings,etc.)
- Other (Youth risk factors)

Brief Explanation

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- After Only (post program)
- Retrospective (post program)
- Before-After (before and after program)
- During (during program)
- Time series (multiple points before and after program)
- Case Study
- Comparisons between program participants (individuals,group,organizations) and non-participants
- Comparisons between different groups of individuals or program participants experiencing different levels of program intensity.

Evaluation Results

Evaluative results are unique to each planned program. See Qualitative Outcome Statement for each.

Key Items of Evaluation

Program #5

V(A). Planned Program (Summary)

1. Name of the Planned Program

Agricultural Viability

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
215	Biological Control of Pests Affecting Plants	20%		20%	
601	Economics of Agricultural Production and Farm Management	50%		50%	
604	Marketing and Distribution Practices	30%		30%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2007	Extension		Research	
	1862	1890	1862	1890
Plan	75.0	0.0	36.0	0.0
Actual	26.0	0.0	37.5	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
477309	0	1272161	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
1898196	0	2274237	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
822080	0	1686909	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Identify critical programmatic foci/needs based on Extension and stakeholder assessment. These can be broadly defined under three areas:

- Production BMPs (nutrient, pest, waste/by-products management, water quality and quantity, energy)
- Financial BMPs (marketing, labor, risk management, policy e.g. farmland preservation)
- Ag Systems (sustainable ag, organic ag, new crops and use/alternative)

Develop an inventory of local (county based), regional and statewide programs designed to meet these needs; identify team members and their roles.

Create a multi-task effort to generate and share research-based information with clientele through demonstrations, educational meetings and workshops, certification programs, trainings, development of recommendation and decision making guides, etc.

2. Brief description of the target audience

Stakeholders (broadly defined to include producers, processors, marketers, end-users, policymakers, legislators)
Commercial agriculture producers and end-users (such as marketers, processors, consumers, etc.)
Municipalities and other governmental and non-governmental agencies, etc.

V(E). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
Plan	8500	1014000	85	140
2007	55585	5968903	115	150

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year	Target
Plan:	2
2007 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan			
2007	64	0	64

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- 166 articles in non-refereed journals, proceedings and abstracts; 492 professional presentations; 324 extension publications, p

Year	Target	Actual
2007	{No Data Entered}	982

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O No.	Outcome Name
1	Short Term Increases in knowledge and skills of agricultural and horticultural industry professionals will occur. · Nutrient management · Pest management · Waste/by-products management and utilization · improving water quality and conserving water · conserving energy · marketing skills · labor management · risk management · policy e.g. farmland preservation · sustainable ag and organic ag production methods · new crops and use/alternative crops
2	Medium Term Productive agricultural land is stabilized to meet the needs of the agricultural industry and the “open space” needs of people of NJ. Agriculture remains a relevant and viable economic sector as profits increase (through reduced costs and/or increased or new sales or revenue streams). Measurable reductions in environmental impact (clear and adequate sources of water, reduced waste, reduced soil losses, reductions in non-point source pollution, etc.) will occur through the adoption of improved and sound management practices. Overall state environmental quality will be enhanced by agriculture, such as through the utilization and recycling of biowastes generated by the non-ag sector or the enhancement of air quality. The products of NJ agriculture will add to the nutritional quality of New Jerseyans food.
3	Long Term New Jersey's agriculture will remain a viable and important industry. New Jersey residents will recognize the importance of agriculture's contributions to societal well being (open space, quality of life) and will support the agricultural industry socially, politically and economically.
4	Short Term - Increases in knowledge and skills of agricultural and horticultural industry professionals will occur. - Nutrient management - Pest Management -Waste/by-products management and utilization -Improving water quality and conserving water - conserving energy - marketing skills - labor management - risk management - policy e.g. farmland preservation - sustainable ag and organic ag production methods - new crops and use/alternative crops.

5	Medium Term - Productive agricultural land is stabilized to meet the needs of the agricultural industry and the 'open space' needs of people in NJ. - Agriculture remains a relevant and viable economic sector as profits increase (through reduced costs and/or increased or new sales or revenue streams). - Measurable reductions in environmental impact (clear and adequate sources of water, reduced waste, reduced soil losses, reductions in non-point source pollution, etc.) will occur through the adoption of improved and sound management practices. - Overall state environmental quality will be enhanced by agriculture, such as through the utilization and recycling of biowastes generated by the non-ag sector or the enhancement of air quality. - The products of NJ agriculture will add to the nutritional quality of New Jerseyans food.
6	Medium Term Productive agricultural land is stabilized to meet the needs of the agricultural industry and the 'open space' needs of people of NJ. Agriculture remains a relevant and viable economic sector as profits increase (through reduced costs and/or increased or new sales or revenue streams). Measurable reductions in environmental impact (clear and adequate sources of water, reduced waste, reduced soil losses, reductions in non-point source pollution, etc.) will occur through the adoption of improved and sound management practices. Overall state environmental quality will be enhanced by agriculture, such as through the utilization and recycling of biowastes generated by the non-ag sector or the enhancement of air quality. The products of NJ agriculture will add to the nutritional quality of New Jerseyans food.
7	Medium Term Productive agricultural land is stabilized to meet the needs of the agricultural industry and the 'open space' needs of people of NJ. Agriculture remains a relevant and viable economic sector as profits increase (through reduced costs and/or increased or new sales or revenue streams). Measurable reductions in environmental impact (clear and adequate sources of water, reduced waste, reduced soil losses, reductions in non-point source pollution, etc.) will occur through the adoption of improved and sound management practices. Overall state environmental quality will be enhanced by agriculture, such as through the utilization and recycling of biowastes generated by the non-ag sector or the enhancement of air quality. The products of NJ agriculture will add to the nutritional quality of New Jerseyans food.
8	Medium Term Production agricultural land is stabilized to meet the needs of the agricultural industry and the 'open space' needs of people of NJ. Agriculture remains a relevant and viable economic sector as profits increase (through reduced costs and/or increased or new sales or revenue streams). Measurable reductions in environmental impact (clear and adequate sources of water, reduced waste, reduced soil losses, reductions in non-point source pollution, etc.) will occur through the adoption of improved and sound management practices. Overall state environmental quality will be enhanced by agriculture, such as through the utilization and recycling of biowastes generated by the non-ag sector or the enhancement of air quality. The products of NJ agriculture will add to the nutritional quality of New Jerseyans food
9	Medium Term Production agricultural land is stabilized to meet the needs of the agricultural industry and the 'open space' needs of people of NJ. Agriculture remains a relevant and viable economic sector as profits increase (through reduced costs and/or increased or new sales or revenue streams). Measurable reductions in environmental impact (clear and adequate sources of water, reduced waste, reduced soil losses, reductions in non-point source pollution, etc.) will occur through the adoption of improved and sound management practices. Overall state environmental quality will be enhanced by agriculture, such as through the utilization and recycling of biowastes generated by the non-ag sector or the enhancement of air quality. The products of NJ agriculture will add to the nutritional quality of New Jerseyans food.
10	Medium Term Production agricultural land is stabilized to meet the needs of the agricultural industry and the 'open space' needs of people of NJ. Agriculture remains a relevant and viable economic sector as profits increase (through reduced costs and/or increased or new sales or revenue streams). Measurable reductions in environmental impact (clear and adequate sources of water, reduced waste, reduced soil losses, reductions in non-point source pollution, etc.) will occur through the adoption of improved and sound management practices. Overall state environmental quality will be enhanced by agriculture, such as through the utilization and recycling of biowastes generated by the non-ag sector or the enhancement of air quality. The products of NJ agriculture will add to the nutritional quality of New Jerseyans food.
11	Long Term - New Jersey's agriculture will remain viable and important industry. - New Jersey residents will recognize the importance of agriculture's contributions to societal well being (open space, quality of life) and will support the agricultural industry socially, politically and economically.
12	Long Term - New Jersey's agriculture will remain viable and important industry. - New Jersey residents will recognize importance of agriculture's contributions to societal well being (open space, quality of life) and will support the agricultural industry socially, politically and economically.
13	- New Jersey's agriculture will remain viable and an important industry. - New Jersey residents will recognize importance of agriculture's contributions to societal well being (open space, quality of life) and will support the agricultural industry socially, politically and economically.

Outcome #1

1. Outcome Measures

Short Term

Increases in knowledge and skills of agricultural and horticultural industry professionals will occur.

· Nutrient management
· Pest management
· Waste/by-products management and utilization
· improving water quality and conserving water
· conserving energy
· marketing skills
· labor management
· risk management
· policy e.g. farmland preservation
· sustainable ag and organic ag production methods
· new crops and use/alternative crops

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	30000	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
215	Biological Control of Pests Affecting Plants
604	Marketing and Distribution Practices
601	Economics of Agricultural Production and Farm Management

Outcome #2

1. Outcome Measures

Medium Term

Productive agricultural land is stabilized to meet the needs of the agricultural industry and the “open space” needs of people of NJ.

Agriculture remains a relevant and viable economic sector as profits increase (through reduced costs and/or increased or new sales or revenue streams).

Measurable reductions in environmental impact (clear and adequate sources of water, reduced waste, reduced soil losses, reductions in non-point source pollution, etc.) will occur through the adoption of improved and sound management practices.

Overall state environmental quality will be enhanced by agriculture, such as through the utilization and recycling of biowastes generated by the non-ag sector or the enhancement of air quality.

The products of NJ agriculture will add to the nutritional quality of New Jerseyans food.

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	35000	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
215	Biological Control of Pests Affecting Plants
601	Economics of Agricultural Production and Farm Management
604	Marketing and Distribution Practices

Outcome #3

1. Outcome Measures

Long Term

New Jersey's agriculture will remain a viable and important industry.

New Jersey residents will recognize the importance of agriculture's contributions to societal well being (open space, quality of life) and will support the agricultural industry socially, politically and economically.

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:
Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	40000	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
215	Biological Control of Pests Affecting Plants
601	Economics of Agricultural Production and Farm Management
604	Marketing and Distribution Practices

Outcome #4

1. Outcome Measures

Short Term - Increases in knowledge and skills of agricultural and horticultural industry professionals will occur.
- Nutrient management
- Pest Management
-Waste/by-products management and utilization
-Improving water quality and conserving water
- conserving energy
- marketing skills
- labor management
- risk management
- policy e.g. farmland preservation
- sustainable ag and organic ag production methods
- new crops and use/alternative crops.

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:
Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Northeast Small Farm & Rural Living Expo & Trade Show

The Northeast Small Farm & Rural Living Expo and Trade Show (a.k.a. Expo) is an educational program designed, planned and delivered by Extension Agents from three universities--Rutgers, Penn State and Cornell. The scope of the Expo is to provide a vertically integrated educational program for the relatively new and ever growing "small farm" interests in the northeast served by the three universities. The vertical integration of the Expo is designed to provide multiple programming in Extension educational based workshops and lectures combined with demonstrations from existing service related industries and small farm entities. Many of the new small farm audience due to their non agricultural background, do not know about Extension and the Extension mission(s) that can assist them as they pursue their small farm experience. Additionally, the small farm producers bring non-agricultural resources and dollars to the regional agriculture infrastructure and economy. Extension can provide valuable education and guidance to the small farm producers to help them be successful in their small farm endeavors.

What has been done

The Expo has been held annually since 2001 in all three states (twice in New Jersey and New York and three times in Pennsylvania) and has attracted over 22,000 participants from eleven states and four countries. The Expo was developed and designed to present educational and extension research based information combined with hands-on programming and real world opportunities for a diverse small farm audience across the state and region. Support agencies and service providers participate as exhibitors and quite often provide added lectures and demonstrations for the small farm producers. Over the last seven years, the Expo has presented over 700 educational programs/lectures given by Extension professionals, industry leaders and small farm producers. Over 900 volunteers have assisted over the seven years with over 375 businesses and agencies providing support and networking opportunities for the small farm producers. Extension personnel and support agency personnel serve on the annual planning committee from each respective state where the Expo is to be held, along with Extension personnel from the other two state universities.
New Jersey has over 9,000 farms based on the farm tax assessment records of which over 90 % would be considered "small" and over fifty percent or more of them would fall in our target audience. Generally, the attendance at the Expo has been made up of new producers who have just acquired small acreage and want to start a small farm enterprise, potential producers who are just beginning to explore the "small farm dream" and existing small farm producers and even large farm producers that are looking for new enterprises to complement or improve on their farming endeavor. Those attending represent traditional, organic and niche producers. To date over 26,000 participants have attended the seven Expo's. In 2006, over 15,000 people visited our web page two weeks prior to the event held in New Jersey. In addition an expanded "youth" program emphasis has been developed to involve youth at the event, both as participants and as spectators.

Results

To evaluate the impact of the Expo, an exit card questionnaire was designed that established a random mailing list from participants that attended the annual multi-state Expo. The post cards were either turned in upon exiting the Expo or were mailed back. Door prizes were administered to encourage the filing of the exit card with a return of 250 to 350 cards annually. Approximately three months after the Expo a questionnaire was mailed out to the exit card list to measure the impact or changes resulting from attending the respective Expo. To date four major reasons for attending the respective Expo's have been recorded by the producers/participants:

* starting a small farm
* explore small farm opportunities
* improve management capabilities
* explore methodologies to enhance country living

Furthermore participants identified specific issues or concerns that they would change or became aware of after attending the seven Expo's:

*64 % agreed that they had identified alternative or new commodities
*77 % indicated that they had interacted and learned from others participating at the Expo

*30 % said they would develop a production and marketing plan
*60 % indicated they developed a better understanding and awareness for support agencies
*51 % indicated they had improved their knowledge on evaluating building and equipment needs
*49 % indicated they had improved their knowledge for marketing
*53 % indicated they were able to take actions that improved their production skills
*63 % indicated they had taken actions to improve their profitability and sustainability

As a direct result of attending the Expo's, participants indicated they had take the following actions based upon the knowledge or information presented at the Expo:

*purchased livestock to better fit their small farm plan
*purchased equipment more appropriate to their small farm needs
*purchased items to assist them with living in the country
*purchased land better suited to their small farm plan and need
*contacted agricultural service agencies for information
*contacted specific growers and producers for more detailed information geared to their small farm goals
*contacted commodity or breed organizations
*performed specific activities related to exhibits, lectures and demonstrations presented at the Expo that would improve on production and marketing skills
*gained knowledge and awareness of Extension and other support agencies

The majority of participants that attended the annual Expo's said they did so to gain knowledge that would assist them in making their small farm enterprise successful and to network with other producers and support agencies.

4. Associated Knowledge Areas

KA Code	Knowledge Area
601	Economics of Agricultural Production and Farm Management
604	Marketing and Distribution Practices
215	Biological Control of Pests Affecting Plants

Outcome #5

1. Outcome Measures

Medium Term - Productive agricultural land is stabilized to meet the needs of the agricultural industry and the 'open space' needs of people in NJ.
- Agriculture remains a relevant and viable economic sector as profits increase (through reduced costs and/or increased or new sales or revenue streams).
- Measurable reductions in environmental impact (clear and adequate sources of water, reduced waste, reduced soil losses, reductions in non-point source pollution, etc.) will occur through the adoption of improved and sound management practices.
- Overall state environmental quality will be enhanced by agriculture, such as through the utilization and recycling of biowastes generated by the non-ag sector or the enhancement of air quality.
- The products of NJ agriculture will add to the nutritional quality of New Jerseyans food.

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Reducing Greenhouse Energy Use by Investing Current and Alternate Technologies

Controlled environment plant production systems (greenhouses and growth chambers) are used worldwide to produce high quality plant material (produce, floriculture-, and nursery crops). Rising energy prices have made a significant impact on the profitability of many greenhouse operations. Engineering information and solutions can help growers reduce energy use and operating costs. Alternative energy sources need to be investigated for potential applicability and economic return. Some of the technologies involved require relatively high initial investment costs. Therefore, research is needed to determine the best possible applications before growers are able to make informed investment decisions.

What has been done

Original research was conducted at the open-roof greenhouse located on Hort Farm 3 (Cook Campus, New Brunswick, NJ) investigating the energy flows associated with the operation of a greenhouse floor heating system. Extensive measurements were collected and used for a computer simulation model that evaluates temperatures and heat distribution throughout the crop environment. The research resulted in the publication of a peer reviewed publication and a trade journal article, and these recommendations for the design and operation of greenhouse floor heating systems can directly be applied by greenhouse growers. Invited presentations on greenhouse energy conservation strategies were conducted at out-of-state extension meetings/workshops (OFA and PPA in Columbus, OH and in Hiroshima, Japan). For both OH meetings, energy audit checklists were developed that growers can use to evaluate their operations and/or to make smart energy decisions about retrofits and/or new construction. Research was conducted and is continuing on three alternative energy projects funded by the New Jersey Department of Environmental Protection (landfill gas fired microturbines used for heat and power production at the NJ EcoComplex greenhouse in Bordentown, NJ), New Jersey Board of Public Utilities (state-wide bioenergy and related technology assessment), and the Rutgers Equine Science Center (digestion of horse manure).

Recent renewal of interest in energy requirements for greenhouses has prompted a series of presentations around the US and abroad on conservation and alternatives. Commercial greenhouses that have adopted most practices developed under the predecessor projects of NE1017, including gutter connected double IR inhibited poly structures with movable insulation and floor heating require about one tenth the heating energy of the average Ohio greenhouse in 1979. Recent efforts to further reduce fossil fuel requirement have focused on designing systems with heat pumps contributing to the first increment of base load heating. Using a spreadsheet design approach with hourly weather data, the option of using storage so a small heat pump can operate 24 hours per day is shown to be advantageous. Utilizing the first increment of energy for floor heating at relatively low delivery temperatures maximizes the efficiency (coefficient of performance) of the heat pump. The feasibility of using the heat pump to cool water during the daytime with a heat exchanger for first stage cooling and storing the heat for night use in floor heating is also being investigated as a design option. Simulation with a Mid Atlantic composite hourly weather data set for a well insulated greenhouse indicate a system incorporating a heat pump delivering only 10 percent of peak heat requirement can provide 38 percent of annual heat requirements when drawing heat from the greenhouse when it requires cooling and from a ground source at other times. A system based on this design concept is under construction at a commercial greenhouse facility.

Results

The original floor heating research has resulted in a M.S. thesis, a peer-reviewed publication, a trade journal article, and has contributed to a soon-to-be released revision of the Rutgers Cooperative Extension Root Zone Heating Extension Bulletin. An energy audit checklist was developed for commercial greenhouse operations. The checklist has been distributed throughout the northeast and beyond. Growers who implemented the information resulting from the research and the various presentations and publications have been able to (conservatively) realize energy savings between 5 and 30%.

Updating and disseminating energy conservation information is helping to further reduce dependence on scarce fossil fuel resources. Incorporation of heat pump technology to take advantage of heat storage to provide both heating and cooling can reduce total energy requirements.

4. Associated Knowledge Areas

KA Code	Knowledge Area
601	Economics of Agricultural Production and Farm Management

Outcome #6

1. Outcome Measures

Medium Term Productive agricultural land is stabilized to meet the needs of the agricultural industry and the 'open space' needs of people of NJ. Agriculture remains a relevant and viable economic sector as profits increase (through reduced costs and/or increased or new sales or revenue streams). Measurable reductions in environmental impact (clear and adequate sources of water, reduced waste, reduced soil losses, reductions in non-point source pollution, etc.) will occur through the adoption of improved and sound management practices. Overall state environmental quality will be enhanced by agriculture, such as through the utilization and recycling of biowastes generated by the non-ag sector or the enhancement of air quality. The products of NJ agriculture will add to the nutritional quality of New Jerseyans food.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Peach Production with Emphasis on Variety Development

The six county area served produces approximately 7,100 acres of peaches and nectarines (fuzzless peaches) with a 2007 production value of $33,000,000 and a tree value of $135,000,000. Approximately 45 commercial peach growers grow and market peaches for the wholesale and retail market. Ninety five percent of the peach crop is grown in this 6 county area.

New Jersey has a long history and tradition of producing peaches. The state for many years has ranked 4th or 5th in production measured by acreage and yields behind California, South Carolina and Georgia. In 2007 New Jersey was actually number 2 in the nation in total peach production.

New Jersey's climate and environment is conducive to the production of high quality peaches. The tree thrives and produces well in our temperate climate. Our sandy loam soils are ideal for the adaptability of peach trees. We generally have abundant rainfall to meet the crops moisture needs and have ample surface and ground water to supplement rainfall. Southern New Jersey is very close to large population centers that are a major advantage in marketing our crop profitably.

In spite of our climate we have difficulties with tree longevity since many of our peach soils have been planted with 3-4 generations of peach trees. Virgin peach soils are hard to find and some of our best peach land is now planted in houses. We also have a wide range of insects, diseases, nematodes, weeds and wild life that not only reduce peach tree health but also blemish and damage the fruit.

To sustain profitability and viability of our industry we must try and understand short life problems and all pests. Our orchards must be efficient and productive. We must also produce quality fruit of the best cultivars since competition is keen in our markets. The marketing season is only three months in southern New Jersey and peaches have a very limited shelf life after harvest.

To sustain this industry we focused on research and education to keep our peach orchards healthy and productive. We conduct research to help our growers produce high quality fruit in a cost effective manner. We conduct research and deliver educational information to help them harvest, handle and store peaches to meet the needs of a competitive market.

What has been done

NJAES faculty and staff supported the following programs:

Pest Management Research and Outreach: Three specialists conduct applied peach research in weed science, tree fruit pathology, and fruit entomology all effectively combating pest problems. Information on their accomplishments and recommendations was delivered at our Mid Atlantic Fruit and Vegetable Convention and Trade Show to 980 fruit growers. In depth information by these specialists was also presented at our South Jersey Fruit meeting to 73 growers. Also held were three twilight and evening fruit meetings and delivered information to 148 growers. Our early summer tour and fruit research meeting was held for 111 growers.

The IPM fruit program associate and IPM fruit agent were involved in diagnosing pest problems and reading and making fertilizer recommendations to 50 % of my growers who produce 80% of the peaches.

Pomology and Soil Science Research and Outreach: The extension pomologist conducted applied research on the testing and evaluation of fruit cultivars; the post harvest physiology and evaluation of peaches; the effect of cable girdling on early maturing peach varieties, and the effect of Retain(r) on peach drop and maturity. We also develop and deliver information on other horticultural practices. We have also delivered educational information a these meetings and through our New Jersey Peach Festival with over 30,000 people(including growers and all our legislators in our district) attending, and our fruit variety showcase with 65 growers, breeders and nurserymen in attendance. Our Fruit Breeder at the New Jersey Agricultural Experiment Station and our soils specialist at NJAES Cooperative Extension also participated in one evening fruit meeting and the Fruit Variety Showcase. We are in the process of introducing 7 new peach varieties with our breeder.

88 field visits to orchards and packing houses were made not only to diagnose grower problems and make recommendations, but also conduct field research.

Writing and Publication: Educational information is delivered to 80 of the states peach growers and 390 other growers, researchers, and allied industry people and 14 agricultural libraries through the publication 4 times per year of New Jersey Horticultural News. 16 articles on fruit science were published to assist these growers through this magazine. Seven of these articles were on peach science.

One hundred and thirty copies of the 2007 Commercial Tree Fruit Production Guide were sold and distributed in the six county area.

Five new information fact sheets on fruit varieties and variety sourcing are in review for publication to growers and allied industry. One fruit variety release has been written for publication office and is being reviewed.

A newsletter called Plant Pest Advisory Fruit is produced and mailed to 235 subscribers by e-mail, ground mail and fax. An additional 1850 hits and downloads were received in 2007 on the newsletter at our RNJAES web site. 16 articles have been written for the newsletter and submitted another 22 for publication to help growers. Four other specialist have written five articles and a regular pest management update is written by the IPN Fruit Agent and his Program Associate.

Six issues of Gloucester Grower News was also written and mailed to 290 growers (45 fruit growers) in 2007. The newsletter contains general information on agricultural management to assist fruit farm viability. The newsletter is also posted on the RNJAES website and received 940 downloads in 2007. Four invited presentations were made to out of stage growers in 2007.

A peach science website is updated regularly with peach information for growers and allied industry. A County NJAES/Cooperative Extension website is updated and maintained with 87,000 visits annually and contains much information on peach programs and other agricultural activities.

Results

We have improved our production efficiency (yield per acre) but due to low temperatures during bloom in the spring our volume was reduced in 2007. Peach prices were lower by about 1.2 cents per pound in 2007.

The challenges are many for our New Jersey growers, but our peach science research and outreach production program has stabilized the industry.

We have continued to be very successful in evaluating and introducing new cultivars. Based on informal survey with fruit trees nurseries all of the major varieties planted in New Jersey are the result of our peach and nectarine cultivar research program. The ten most important yellow- fleshed planted by NJ growers are in relative order of importance: John Boy, Flamin Fury(r) PF24-007, Laurol, Encore, Sentry, Bounty,Flamin Fury(r) PF 23, Flamin Fury(r) PF 17, Flamin Fury(r) PF 27A, and Flame Prince. Two new yellow fleshed peaches developed by the RNJAES Messina(tm) and Gloria(tm) are being heavily planted in 2007 and 2008 with over 5000 trees planted and ordered. Other varieties heavily planted as a result of our research and recommendations ate Glenglo, GaLa, Flamin Fury(r) PF 7, Flamin Fury(r) PF Lucky 13, Flamin Fury(r) PF Lucky(r) 24C, Contender, Autumn Star, Flamin Fury(r) PF 28-007 and Victoria(tm). Yellow-fleshed peaches make up 88% of our production volume.

We have also made major impacts in researching novel and other types of peach varieties now recommended to our growers. The production of nectarines has declined slightly because of pest management problems but two varieties researched and tested by us for growers are the yellow fleshed varieties Easternglo and Flamin Fury(r) PF 11; and the white fleshed varieties; Arctic Star, Arcticglo, Arctic Sweet, Arctic Jay, and Arctic Pride.

Our research continues to make an impact in the slow resurgence of white-fleshed peach varieties. From our research and recommendations growers continue to plant Spring Snow. White Lady, Klondike, Sugar Giant and Snow Giant. We also see a slight increase in plantings of flat peaches with Saturn(r) and the newly developed varieties from our NJAES program; NJ 14, NJ 15, NJ 16, and NJ 17. We know almost 900 trees of these new flat peach varieties have or will be planted in 2007 and 2008. Our research and recommendations on peach cultivars are the basis of peach plantings in the Mid Atlantic states.

Our peach research program on pest management has a major impact on peach plantings and sustainability in southern New Jersey. Our "Production guide" is the main source of peach information, it is a best management practice document used by the State Agricultural Development Committee. Ninety percent of our growers follow weed management programs utilizing the pesticides we evaluate and recommend. Because of the high incidence or pest pressure 99% follow our ongoing pest management recommendations for disease and insects. We have improved the control of diseases like brown rot, peach scab, rusty spot, and bacterial spot resulting in better fruit quality and tree health. We have improved the identification of varieties with natural tolerance, or susceptibility to rusty spot and bacterial spot. We have developed many alternatives in insect management through the use of better ground cover management, and insect pheromones and mating disruption to reduce insecticide applications.

We are learning more about fruit drop, thinning, fruit sizing and the handling and storage of peaches to lengthen the market season with high quality varieties.

All of these have helped the viability and sustainability of our peach industry. Our targeted and integrated pest management practice and our recommendations recommending less fertilizer usage have reduced cost and non-point source pollution in soils and waters.

4. Associated Knowledge Areas

KA Code	Knowledge Area
604	Marketing and Distribution Practices
601	Economics of Agricultural Production and Farm Management
215	Biological Control of Pests Affecting Plants

Outcome #7

1. Outcome Measures

Medium Term Productive agricultural land is stabilized to meet the needs of the agricultural industry and the 'open space' needs of people of NJ. Agriculture remains a relevant and viable economic sector as profits increase (through reduced costs and/or increased or new sales or revenue streams). Measurable reductions in environmental impact (clear and adequate sources of water, reduced waste, reduced soil losses, reductions in non-point source pollution, etc.) will occur through the adoption of improved and sound management practices. Overall state environmental quality will be enhanced by agriculture, such as through the utilization and recycling of biowastes generated by the non-ag sector or the enhancement of air quality. The products of NJ agriculture will add to the nutritional quality of New Jerseyans food.

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Specialty Crop Production and Marketing

Economic opportunities have arisen in the last decade for specialty crop agriculture catering to the diverse consumer markets along the eastern coast of the United States. The rapid expansion of ethnic populations and a consumer demand for specialty and organically grown foods presents significant opportunities for fruit and vegetable producers in the region to take advantage of the comparative advantages associated with close proximity to densely populated areas. In response to a need for East Coast farmers to remain economically viable, a U.S. Department of Agriculture, National Research Initiative study was initiated to document and quantify the current available market opportunities so that farmers may engage the market by growing crops targeted from a demand perspective. In response to strengthening NJ commercial specialty crop production and marketing, an NJVGA grant was awarded for specialty tomato research which is needed to counteract the crashing markets for commodity tomato varieties.

What has been done

Analysis of 2006 consumer survey data continued through 2007. New specialty crop production data from years 2006 and 2007 were assessed to better determine agricultural activities. The Wats Room Incorporated (WATS), was contracted to conduct 1,355 telephone interviews using Computer-Assisted Telephone Interview (CATI) technology. Qualified (bi-lingual) interviewers received on-site Human Subjects Certification Program (HSCP) training, per Federal-wide Assurance guidelines, in addition to survey-specific training and practice, prior to conducting actual interviews. Over 13,000 potential interviewee leads were utilized by WATS in order to meet the sample size requirements.

Despite the competitive disadvantages relative to year-round producers in lower production cost areas, significant comparative advantages exist for local East Coast growers as a result of densely populated areas rich in ethnic diversity and subject to rapidly changing food trends. It has become increasingly necessary for these producers to adopt new crops and create new value-added opportunities in order to remain economically viable. Growing ethnic crops, classic vegetables and local organic produce present opportunities for producers to exploit existing comparative advantages associated with serving densely populated local markets in order to sustain farming operations and increase profitability. The coordination of production and marketing are critical to avoid the threats of rapid over-production (which can quickly lead to an oversupply of a particular product and depressed prices) and overcome inadequate marketing infrastructure in order to move product into community markets. Establishing and extending existing cooperative marketing memberships or affiliations along the East Coast, from North to South, can create an improved market system that provides appropriate year-round supplies to the area.
The general objectives of our USDA-NRI study were to:
1)identify and estimate the market size for ethnic segments that present significant opportunities to local growers;
2)assess demand, conduct production studies, and make recommendations for appropriate ethnic produce items to locally address this market; and
3)develop strategies and production timelines to coordinate production of select ethnic crops to exploit this market niche.
The intended outcome of the project was to generate and distribute science-based information about production, marketability, and utilization of selected ethnic crops and herbs. This initiative bridges the supply-demand gap and expects to deliver practical solutions to economic problems faced by many vegetable growers, and contribute to the nutritional and health needs of regional consumers.
After completing the first phase of the ethnic produce project related to consumer survey results, the second phase focused on crop production research and demonstration. The four primary objectives of this phase were to:
1)establish a common set of field demonstration and research plots in each collaborating state;
2)demonstrate and evaluate a variety of ethnic crops grown at each site;
3)conduct case-studies of specialty-ethnic produce growers; and communicate ethnic crop production information to advisors and growers via presentations, tours, websites, fact sheets, articles, and other forms of informational literature.
The general objective of our NJ specialty tomato studies over the last five years now focuses on developing a flagship product - the New Jersey bred Ramapo tomato with classic Jersey Tomato taste.

Results

The results of the produce expenditure data from 1,084 surveys completed by ethnic produce purchasers, combined with the expertise of local crop specialists provided the tools necessary to prioritize crops for subsequent production research.
The survey results were used by our USDA/NRI team to Assess Demand and Supply of ethnic vegetables and rank them by ethnicity. Results of the USDA-NRI survey of 271 randomly selected East Coast consumers from each of the four ethnic groups were used to rank the crops included in the questionnaire, within ethnicity, according to expenditure and/or purchase data. Multiple criteria were established to rank produce items according to: (1) mean (weekly) expenditures across all respondents (including zero purchases); (2) mean (weekly) expenditures across only respondents purchasing that item (excluding zero purchases); (3) frequency of purchase across respondents (binary; 1 or 0 for purchase or non-purchase, respectively), (4) volume (number of pounds, bunches, or units) purchased by each respondent for each produce item; and (5) overall rank (average of results rankings #1 thru #4) for each produce item. A summary of all this comprehensive information was provided in 2007 via several PowerPoint presentations created to over 20 agricultural organizations. At least 50 farmers adjusted their planting intentions to better capitalize on high value specialty crops.

The outcome of the detailed survey results has led to an immediate new view of the ethnic consumer, their location and concentrations and their buying power. Considerable data has been developed for consumer produce expenditures of ethnic crops and consumer demographics. The crop selection process has identified over 100 ethnic crops of interest and through a rigorous process of elimination settled on a refined list of 42 crops (10 each for Asian-Indian and Puerto Rican and 12 for Chinese) to assess demand. A final list for field production research and demonstration was designed for seven field sites in New Jersey, Florida, and Massachusetts.
Summer 2006 and 2007 demonstration and research trials were established by collaborators in Massachusetts and New Jersey on research farms. The trials included several commercially available cultivars of the selected crops blocked by ethnic market, crop type, and/or production system. Crop quality and yield parameters were measured and evaluated statistically to determine suitability for commercial production. For the 2006/07 trials, four demonstration crops and three research crops selected on previously described criteria were established at six sites located in three states along the East Coast: two in Florida, one in Massachusetts, and three in New Jersey.
Crop quality and yield parameters were measured and evaluated statistically for each site, with specific regard for cost factors, seasonal/monthly yield variations, and seed availability (imports or recently developed hybrids) in order to make recommendations for geographic sequencing of production, by month/season. This outcome starts the marketing plan to sustain a twelve month production supply in the Eastern United States in a cooperative venture to ward off the threat of imports into the East Coast to exploit local comparative advantages and to assess the ability to increase local supply during peak demand periods.

As a result of the research and communication program for transitioning to specialty organic production, such as organic farming presentations, farm demonstrations and farm visits, six new blueberry farms were assisted in transitioning to organic blueberry production totaling over 55 acres and over 10 organic vegetable farms were added. In addition new courses were added to the undergraduate curriculum on international and organic agriculture.

4. Associated Knowledge Areas

KA Code	Knowledge Area
604	Marketing and Distribution Practices
601	Economics of Agricultural Production and Farm Management

Outcome #8

1. Outcome Measures

Medium Term Production agricultural land is stabilized to meet the needs of the agricultural industry and the 'open space' needs of people of NJ. Agriculture remains a relevant and viable economic sector as profits increase (through reduced costs and/or increased or new sales or revenue streams). Measurable reductions in environmental impact (clear and adequate sources of water, reduced waste, reduced soil losses, reductions in non-point source pollution, etc.) will occur through the adoption of improved and sound management practices. Overall state environmental quality will be enhanced by agriculture, such as through the utilization and recycling of biowastes generated by the non-ag sector or the enhancement of air quality. The products of NJ agriculture will add to the nutritional quality of New Jerseyans food

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Preserving Farmland in Bergen County

Farmland in Bergen County has been disappearing at an alarming rate. Pressures for development have brought about the loss of Bergen's farmland at a rate higher than the rest of the state due to higher value per acre of developable land. According to USDA census of agriculture Bergen has lost over 13% of its farms in the past 15 years. In 1992 there were 70 farms; in 1997 there were 63; in 2007 there are 61. Looking at the past century, there were 1600 farms in 1890 occupying more than half of the county's land. The agricultural legacy of Bergen County as a supplier of crops is lost to history.

While the ornamental industry and allied professions maintain a strong and viable presence, there is precious little farmland and much is in eminent peril of being lost.

What has been done

To prevent further loss of farmland to development. The County Agricultural & Resource Management Agent has educated farm families, county government and the general public about the Farmland Preservation Program (FP) and emphasize the value of farmland for open space, anti-erosion, wildlife habitat, and air quality enhancement.

He has maintained a high level of activity at the Bergen County Agricultural Development Board. Activities include:
- Yearly outreach to farmland owners informing them of the Farmland Preservation (FP) Program and promoting its benefits
- Developing market pieces (brochures and posters) and distributing them yearly to entice farm families to participate in FP; educate the public about the importance of supporting FP.
- Yearly reviewing of applications for FP and ranking the applicants according to state guidelines.
- Yearly visits to existing preserved farms and to new applicants.
- Prioritizing applicants and making recommendations to County Agricultural Development Board, then to State Agricultural Development Board for funding.
- Working with existing farms to help ensure economic viability and success. Providing Best Management Practices and pest control recommendations to solve problems.

Results

- In 2007, one more Bergen County Farm (Kohout) was successfully preserved under the FP program. This farm totals over 40 acres. With this, there are 7 preserved farms totaling over 300 acres, representing 30% of remaining farmland.
- $1500.00 expended by Bergen County Department of Planning to print 5000 brochures and 750 posters promoting Bergen County farms and the FP program. These have been distributed at all agricultural events and other appropriate opportunities.
- There is continuous promotion of FP program
- There is ongoing assistance to all farms for maximizing Best Management Practices, economic viability, and assisting with emerging problems such as drought, hailstorms, deer, etc.

4. Associated Knowledge Areas

KA Code	Knowledge Area
601	Economics of Agricultural Production and Farm Management

Outcome #9

1. Outcome Measures

Medium Term Production agricultural land is stabilized to meet the needs of the agricultural industry and the 'open space' needs of people of NJ. Agriculture remains a relevant and viable economic sector as profits increase (through reduced costs and/or increased or new sales or revenue streams). Measurable reductions in environmental impact (clear and adequate sources of water, reduced waste, reduced soil losses, reductions in non-point source pollution, etc.) will occur through the adoption of improved and sound management practices. Overall state environmental quality will be enhanced by agriculture, such as through the utilization and recycling of biowastes generated by the non-ag sector or the enhancement of air quality. The products of NJ agriculture will add to the nutritional quality of New Jerseyans food.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Enhancing the Economic Opportunities of the New Jersey Blueberry Industry

New Jersey has approximately 8,000 acres of highbush blueberries and is ranked second in total production and value in the USA. The value of this industry was $90.2 million in 2007 and is one of the most viable agricultural industries in New Jersey. The top priority for the program is to provide New Jersey blueberry growers with all they need to remain viable and stay on the cutting edge of technology. Blueberries are being grown in more parts of the USA and the world than ever before and as a result competition for markets is ever increasing. New Jersey growers must remain on the cutting edge of production methodology. Extension personnel are the primary source of this information.

What has been done

A series of grower meetings is in place. The primary audience for the program objectives are the New Jersey blueberry growers and aspiring growers. Grower participation has increased every year at all extension meetings. A blueberry session is held on an annual basis at the NJ Vegetable Conference in Atlantic City. This first meeting of the year is to provide growers with an overview of the current research being conducted by Rutgers and USDA personnel. The second meeting of the season is called the Blueberry Open House and gives the growers knowledge on all aspects of blueberry growing, including the control of insects, diseases, nutrition, marketing, and pesticide regulations. A series of twilight meetings is held at various locations to address timely issues of blueberry production.

A newsletter is sent to growers on a weekly basis with information from Rutgers and USDA personnel plus IPM scouts. One on one visits are conducted to address any problems that arise on individual farms.

A blueberry advisory committee has been put together and three meetings took place in 2007 to address research and extension needs and priorities.
Research projects are being conducted to address industry priorities.

Results

Survey data from the Blueberry Open House meeting indicated that 92% of attendees felt that this meeting was excellent or very good. In addition, the newsletter reaches growers in 37 states and 21 countries. New Jersey acreage increased in 2007 by 150 acres. The value of the New Jersey blueberry crop rose from $83 million in 2006 to $90.2 million in 2007 a 8.6% increase. 39% of growers attending the Blueberry Open House meeting stated that information obtained at this meeting will result in a re-evaluation of their current methods. The Blueberry Bulletin has a total circulation of 3,841 and on the web there were 6,1,01 downloads. 94% of growers rated the newsletter excellent. The Blueberry Grower Advisory committee has given RCE personnel a priority list of research needs and research projects in 20008 will reflects their suggestions.

4. Associated Knowledge Areas

KA Code	Knowledge Area
604	Marketing and Distribution Practices
601	Economics of Agricultural Production and Farm Management
215	Biological Control of Pests Affecting Plants

Outcome #10

1. Outcome Measures

Medium Term Production agricultural land is stabilized to meet the needs of the agricultural industry and the 'open space' needs of people of NJ. Agriculture remains a relevant and viable economic sector as profits increase (through reduced costs and/or increased or new sales or revenue streams). Measurable reductions in environmental impact (clear and adequate sources of water, reduced waste, reduced soil losses, reductions in non-point source pollution, etc.) will occur through the adoption of improved and sound management practices. Overall state environmental quality will be enhanced by agriculture, such as through the utilization and recycling of biowastes generated by the non-ag sector or the enhancement of air quality. The products of NJ agriculture will add to the nutritional quality of New Jerseyans food.

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

New Blueberry Scorch Antibodies

Blueberry Scorch is an important and common disease of blueberries, and an result in severe blighting of flowers and young leaves, twig dieback, and yield reductions of more than 85%.

What has been done

Blueberry plants have been tested for two strains of Blueberry scorch virus following graft inoculation experiments of a range of blueberry cultivars performed at the Rutgers Marucci Center for Blueberry and Cranberry Research. This revealed several varieties that are symptomless following infection with either virus strain. Antisera and reagents for testing of nursery plants were provided to the New Jersey Department of Agriculture for continuation of their nursery stock testing program. More Blueberry schorch virus was propagated in the greenhouse and purified in the laboratory for production of a new antiserum.

Results

Deployment of antibodies for virus identification in nursery stock plants allows the New Jersey State Department of Agriculture to contain the extremely harmful Blueberry scorch virus to prevent further spread across the U.S. Identification of virus-susceptible, virus-resistant, and virus-tolerant plants allows for their immediate deployment to growers and their use as breeding stock for improvement of currently available blueberry varieties.

4. Associated Knowledge Areas

KA Code	Knowledge Area
215	Biological Control of Pests Affecting Plants

Outcome #11

1. Outcome Measures

Long Term - New Jersey's agriculture will remain viable and important industry.
- New Jersey residents will recognize the importance of agriculture's contributions to societal well being (open space, quality of life) and will support the agricultural industry socially, politically and economically.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Weed Management Systems Intergrating the Use of the New Herbicide Flumioxazon in Field and Container Ornamental Production

Weed management in field and container ornamental production represent one of the largest economic inputs in terms of labor and herbicides for ornamental producers. The development and integration of new, more effective herbicides will reduce these economic inputs and provide environmental benefits by decreasing herbicide use. In addition, glyphosate resistant marestail is rapidly spreading throughout New Jersey nursery operations. Alternatives strategies for the control of this weed need to be researched and identified.

What has been done

Research has assisted in the development and commercialization of the herbicide flumioxazon (Broadstar, SureGuard) for use in field and container grown ornamentals. Comprehensive field and container studies were conducted over seven years and recommendations delivered to the New Jersey ornamental production industry. This research has demonstrated that flumioxazon provides equal and in many cases superior weed control of broadleaf weeds then currently used products. We have also determined that flumioxazon provides excellent control of marestail and Asiatic dayflower, two weeds that have become increasingly problematic in field ornamental production. Research is currently being conducted to determine optium application timing for control of these weeds. The determination that flumioxazon has the potential to control marestail is especially critical since we have now confimed the spread of glyphosate resistant marestail into New Jersey nursery operations. In addition, the use rate of flumioxazon is 0.25 to 0.38 lbs ai/A, while currently used herbicides are used at 1.0 to 2.0 lbs ai/A.

Results

The proper integration of flumioxazon into an overall weed management program will provide superior broadleaf weed control for New Jersey producers compared with existing products. In field ornamental production, the price for flumioxazon will average approximately $75 per treated acre, while currently used broadleaf weed herbicides average approximately $100 per treated acre. In container production, the granular formulation of flumioxazon will average approximately $180 per treated acre while granular formulations of herbicides which provide comparable weed control average $240 per treated acre. Additionally, The effective use rate of flumioxazon is approximately 20-25% of existing herbicides resulting in a significant decrease in the total pounds of active herbicide used in field and container ornamental production. While it is difficult to estimate the impact glyphosate resistant marestail will have on New Jersey nursery operations in terms of weed competition, a nursery operation that becomes infested with glyphosate resistant marestail and must use an alternative non-selective herbicide will see increased costs of $60 to 80 dollars per treated acre. The use of flumioxizon as part of a fall preventative herbicide treatment shows a great deal of potential to control this weed.

4. Associated Knowledge Areas

KA Code	Knowledge Area
215	Biological Control of Pests Affecting Plants
601	Economics of Agricultural Production and Farm Management
604	Marketing and Distribution Practices

Outcome #12

1. Outcome Measures

Long Term - New Jersey's agriculture will remain viable and important industry.
- New Jersey residents will recognize importance of agriculture's contributions to societal well being (open space, quality of life) and will support the agricultural industry socially, politically and economically.

2. Associated Institution Types

•1862 Extension
•1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Identification, Evaluation, and Intergration of New Herbicides for Selective Control of Annual and Roughstalk Bluegrass in Cool-Season Turfgrass.

Poa annua (annual bluegrass) and Poa trivialis (roughstalk bluegrass) are two of the most problematic and difficult to control weeds on golf courses, athletic fields and sod farms. Infestations of these weeds reduce playability of athletic fields because they will thin and die out under heavy traffic. The value of cultivated sod infested with these weeds is greatly reduced and may not even be able to be sold. Most importantly, golf course fairways, tees and putting greens infested with these weeds require greater fungicide and water inputs to maintain an acceptable playing surface during summer months. The identification and evaluation of potential new herbicides for selective control of Poa annua and Poa trivialis in cool-season turfgrass would be beneficial when integrated into an overall weed management plan.

What has been done

Research has been conducted over the past 6 years to evaluate the potential of many herbicides, currently labeled for use in agronomic crops, for postemergence control of Poa annua and Poa trivialis in cool season turfgrasses. This work has led to the identification of four experimental herbicides; bispyribac-sodium, primisulfuron, sulfosulfuron, and mesotrione as having potential for selective use in cool-season turfgrass for Poa annua and Poa trivialis control. Past research studies have focused on seasonal and sequential application timing effects, soil residual properties and cool-season turfgrass tolerance. Currently we are conducting multi-year studies to determine the influence of golf course management practices (mowing height, fertility, use of plant growth regulators) on creeping bentgrass safety and Poa annua control. We have also determined that spray adjuvants, especially non-ionic surfactant increase the efficacy of bispyribac-sodium by enhancing foliar absorption. This may potentially allow application rates to be reduced by up to 50%.

Research has also determined that primisulfuron has the potential to control Poa annua and Poa trivialis in Kentucky bluegrass. We have determined optimum application timing, number of applications and rates. A 24c (special local needs) label was granted in Colorado, Minnesota, and Illinois based upon my research. A 24c label will be requested for New Jersey and Delaware in 2008.

In the fall of 2005 we initiated research to determine if mesotrione could control Poa annua at turfgrass seeding. To date we have determined that mesotrione can be safely used at seeding on Kentucky bluegrass, perennial ryegrass, and tall fescue. Substantial but not complete control of annual bluegrass was achieved. We are now conducting research to determine optimum application rates and regimes.

The results of bispyribac-sodium studies have been presented at scientific meetings and to the golf course industry at the New Jersey Turfgrass Expo and regional turfgrass meetings including the Maryland Turfgrass Conference, the Metropolitan Golf Course Superintendents Association Winter Seminar and the New York State Turfgrass Association Empire State Green Industry Show. They have also been disseminated at various industry sponsored seminars in New Jersey, Pennsylvania, Delaware, Maryland, and Virginia.

Results

Based upon recommendations provided to golf course superintendents 90 to 100% control of Poa annua and 70 to 80% control of Poa trivialis is achievable when Velocity is properly integrated into an overall Poa annua control program.

Results concerning the research with primisulfuron and mesotrione have yet to be disseminated because they are not yet labeled.
Sulfosulfuron (Certainty) has been labeled for use in both warm and cool-season turfgrass species and can be safely and effectively used in Kentucky bluegrass and perennial ryegrass for control of Poa trivialis. Bispyribac (Velocity) received full federal registration from the EPA in the fall of 2004 and can be safely and effectively used for control of both weed species on all cool-season turfgrass species (including creeping bentgrass) except Kentucky bluegrass. Control of these weeds on golf courses will lead to reduced fungicide and water use, improve the quality of cultivated sod, and the playing surfaces of athletic fields.

It is estimated that there is approximately 250,000 to 300,000 acres of highly maintained fairways, tees and putting greens in the cool-season turfgrass growing region in the United States and at least 50% of these acres have significant infestations of Poa annua and/or Poa trivialis. It is estimated that golf courses could reduce fungicide use on these acres by approximately 30% if these two weeds were controlled resulting in an annual reduction of 700,000 pounds active ingredient of fungicides and saving approximately 8.0 million dollars annually. It is estimated that water use could be reduced by approximately 25% resulting in a reduction of 8.0 million gallons of water per golf course per year. Total water saved on an annual basis would be approximately 4.3 billion gallons of water per year.

Mesotrione and primisulfuron will have the greatest impact on cultivated sod production and possibly athletic fields. There are approximately 9000 acres of cultivated sod in New Jersey with about 66% dedicated to Kentucky bluegrass. Poa annua bluegrass infestations can reduce the value of Kentucky bluegrass sod by up to 50%. An acre of Kentucky bluegrass sod currently grosses $9000. This value may be reduced to as much as $4500 an acre if infested with Poa annua.

4. Associated Knowledge Areas

KA Code	Knowledge Area
601	Economics of Agricultural Production and Farm Management
215	Biological Control of Pests Affecting Plants

Outcome #13

1. Outcome Measures

- New Jersey's agriculture will remain viable and an important industry.
- New Jersey residents will recognize importance of agriculture's contributions to societal well being (open space, quality of life) and will support the agricultural industry socially, politically and economically.

2. Associated Institution Types

•1862 Extension
•1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Resistance Managment for Fresh-Market and Processing Vegetable Crops Grown in New Jersey

The development of fungicide resistance in important fungicide chemistries used in vegetable production has been documented in New Jersey and the mid-Atlantic region. A number of these commonly-used chemistries have a high-risk for resistance development if they are overused or used improperly. Vegetable growers in NJ, as well as, the rest of the mid-Atlantic region need more information on fungicide chemistries (FRAC codes) in order to manage fungicide resistance development properly. Once resistance has developed, the efficacy of the fungicide, in most cases, is greatly reduced or lost. A great emphasis has been put on teaching vegetable growers in the state the importance of knowing and understanding the importance of FRAC codes in fungicide resistance management in vegetable disease control. In 2007, fungicide resistance management guidelines were developed for all 30 crop groups listed in the 2007 commercial vegetable production recommendations guide for the five mid-Atlantic states (NJ, PA, VA. MD, DE) to help vegetable growers manage potential fungicide resistance development. This guide helps growers make decisions about which fungicides should be used to control specific diseases to help reduce the chances for fungicide resistance development.

What has been done

Over 2,500 A of pumpkin crops are grown annually in New Jersey with an estimated 7.5 M ($3,000 A) going towards production costs. Much of this cost is associated with fungicide applications for controlling important diseases. In previous years, FRAC code 11 fungicides were recommended to be applied every 14 days in rotation with a FRAC code 3 fungicides. Thus, 50% of the fungicides applied to pumpkin crops belonged to FRAC code 11 or FRAC code 3 fungicides. Reducing the use of fungicides no longer effective in controlling important diseases, such as cucurbit powdery mildew, will help growers save hundreds of thousands of dollars per year. From 2005 to 2007, a study was done to determine if fungicide resistance would develop to two commonly used fungicides (FRAC codes 3 and 11) in cucurbit powdery mildew production. Results of the study determined that fungicide resistance to the strobilurin (FRAC group 11) and DMI fungicides (FRAC code 3) could develop on an annual basis if either of these groups of fungicides were mis- or overused in cucurbit production.
Additionally, in 2007, fungicide resistance management guidelines were developed for pumpkins, as well as, all other crop groups listed in the 2007 commercial vegetable production recommendations guide for the five mid-Atlantic states (NJ, PA, VA. MD, DE) to help vegetable growers manage fungicide resistance development on their farm. In 2007, a total of 561 fungicide resistance management guides were distributed to vegetable growers in the mid-Atlantic region representing over 42,000 A of vegetable production.

Results

The Fungicide Resistance Management Guide is targeted for commercial vegetable farmers in New Jersey and the other four mid-Atlantic states (PA, DE, VA, MD). Questionnaires were handed out when FRAC guides were distributed to growers at meetings throughout the region during the 2007 production season.

Of the questionnaires returned in the response to the FRAC guide:

Vegetable growers responded to the following questions:

How much more aware are you on the importance of understanding fungicide resistance development?
62% - more aware, 38% - highly aware

How useful was the guide?
43% said somewhat useful, 58% said highly useful

How easy is the guide to use?
54% - very easy, 46% somewhat easy, 0% difficult or very difficult

Would you use the guide to help make decisions?
24% - some of the time, 73% - always

The impact of this research helped determine that FRAC code 11 fungicides should no longer be used to control cucurbit powdery mildew, thereby greatly reducing the potential for fungicide resistance development and helping growers reduce costs by not applying ineffective fungicides. Research also determined that growers should also use FRAC code 3 fungicides in cucurbit production judiciously because the potential for resistance development exists.

Additionally, a fungicide resistance management guide was developed for commercial vegetable growers in the mid-Atlantic region. In total, 561 resistance management guides were distributed to vegetable growers in the region representing 42,000 of production. A new fungicide resistance management guidelines for 2008 has been developed and will be distributed to more vegetable growers in the mid-Atlantic region. The fungicide resistance management guide will help vegetable growers in New Jersey and the rest of the mid-Atlantic region reduce the chances for fungicide resistance development.

4. Associated Knowledge Areas

KA Code	Knowledge Area
601	Economics of Agricultural Production and Farm Management
215	Biological Control of Pests Affecting Plants

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought,weather extremes,etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programatic Challenges
- Populations changes (immigration,new cultural groupings,etc.)

Brief Explanation

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- Before-After (before and after program)
- During (during program)
- Time series (multiple points before and after program)
- Comparisons between program participants (individuals,group,organizations) and non-participants
- Comparisons between different groups of individuals or program participants experiencing different levels of program intensity.
- Comparison between locales where the program operates and sites without program intervention

Evaluation Results

Evaluation results are unique to each program. See Qualitative Outcome Statements.

Key Items of Evaluation

Program #6

V(A). Planned Program (Summary)

1. Name of the Planned Program

Sustainability of NJ Equine Industry and Its Impact on Agriculture and Open Space

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
301	Reproductive Performance of Animals	20%		20%	
302	Nutrient Utilization in Animals	20%		20%	
303	Genetic Improvement of Animals	20%		20%	
312	External Parasites and Pests of Animals	20%		20%	
315	Animal Welfare/Well-Being and Protection	20%		20%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2007	Extension		Research	
	1862	1890	1862	1890
Plan	5.0	0.0	2.0	0.0
Actual	4.0	0.0	1.7	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
147860	0	40569	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
541636	0	143405	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
161502	0	158506	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Conduct 2006 Economic Impact Study

Horse Management seminars and Equine Science Update – county and statewide
Public relations and promotions
Actively engaged as outside speakers for the industry State 4-H horse program
Perform consultations to individuals and agricultural organizations

Maintain Research-based website

Conduct research to impact policy decisions for industry

Conduct Roundtables

Produce research based materials

Hold Annual Stakeholder meeting to Identify issues of importance

RUBEA – advisory committee

Facilitate the opportunity to network within the industry

2. Brief description of the target audience

Equine users – including, students/youth, equestrians, owners

Equine professionals: veterinarians, researchers, industry leaders, farmers, service providers, trainers, breeders, stable managers

Legislators/Government Officials/Industry Officials e.g. Racing Commission, Sport and Competition Officials (FEI, USEF)

Educators

General public

V(E). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
Plan	4000	30000	3000	4000
2007	3500	20000	4000	6000

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year	Target
Plan:	1
2007 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan			
2007	0	5	5

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Economic Impact Study, Educational Seminars at state and county levels. 3 news releases, 63 extension publications, 7 stud

Year	Target	Actual
2007	{No Data Entered}	0

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O No.	Outcome Name
1	Short Term New Jersey residents and government officials will be made aware of the importance of the equine industry Equine enthusiasts take leadership roles to unify the industry and will acquire knowledge to support the industry's sustainability Equine industry segments will learn the importance and benefits of speaking in one voice
2	Medium Term Diverse equine-related units are organized into one voice Misperceptions by the general public re: the segments of equine industry are corrected All uses of the horse are recognized as agricultural by local and state government officials
3	Long Term Equine industry is unified and is economically sustainable Equine industry is recognized as a critical component of the economic development, of traditional agriculture, and the preservation of open space
4	Short Term New Jersey residents and government officials will be made aware of the importance of the equine industry Equine enthusiasts take leadership roles to unify the industry and will acquire knowledge to support the industry's sustainability Equine industry segments will learn the importance and benefits of speaking in one voice
5	Long Term Equine industry is unified and is economically sustainable Equine industry is recognized as a critical component of the economic development, of traditional agriculture, and the preservation of open space
6	Long Term - Equine industry is unified and is economically sustainable Equine industry is recognized as a critical component of the economic development, of traditional agriculture, and the preservation of open space
7	Long Term: Equine industry is unified and is economically sustainable Equine industry is recognized as a critical component of the economic development, of traditional agriculture, and the preservation of open space

Outcome #1

1. Outcome Measures

Short Term

New Jersey residents and government officials will be made aware of the importance of the equine industry

Equine enthusiasts take leadership roles to unify the industry and will acquire knowledge to support the industry's sustainability

Equine industry segments will learn the importance and benefits of speaking in one voice

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	20000	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Antioxidants, Oxidative Stress and Performance in the Horse

The ability to exercise is as important to the horse, as lactation is to the dairy cow. The impact of the research performed will give the trainer, owners and breeders of performance horses a better idea of the effect of various antioxidants and the levels of supplementation needed to produce the desired effect. Over-supplementation is common in the horse industry and better-determined supplementation levels will make feeding horses more economical to the horse and barn owners.

Losses of top equine athletes at the 1992 Olympic Games in Barcelona and the 2002 World Equestrian Games in Jerez, Spain have provoked public interest in the performance and welfare of competitive horses. Oxidative stress has become recognized as one of the possible harms. Oxidative stress occurs when the antioxidant defense system in the body is overwhelmed with reactive oxygen species (ROS). An increase in ROS may occur due to increased exposure to oxidants from the environment, increased production within the body from an increase in oxygen metabolism during exercise, or an imbalance in antioxidants. Useful properties of ROS include targeting of bacteria and viruses during respiratory bursts in phagocytes, and serving as special messengers within neurons. However, if ROS accumulation becomes too great it can be damaging to the DNA, protein and lipids in cells. Oxidative stress has been implicated in the pathogenesis of certain diseases (e.g. cancer, AIDS, and Alzheimer's disease) and has been linked with the aging process and exercise.

There is evidence showing that oxidative stress does exist in the intensely exercising horse; however, there has never been an attempt to quantify the feeding or management practices that would reduce the levels of oxidative stress. It is also not easily determined how much of a particular supplement would provide the horse the most benefit. In many circumstances horse and barn owners are over-supplementing with compounds that are unnecessary or having a negative impact on metabolism of other nutrients in the diet.

What has been done

Overall objective is to determine the levels of vitamin E and other antioxidants needed in the intensely working horse to maximize performance and minimize the negative effects of oxidative stress, muscle membrane leakage and apoptosis.
We have determined the best level of vitamin E needed to minimize the negative effects of oxidative stress, muscle membrane leakage and apoptosis in the intensely exercising horse. The results of this study have been presented and published at the International Conference of Equine Exercise Physiology in France, August 2006, and select parts have been incorporated into a talk at an invited presentation at the European Association of Animal Producers in Antalya, Turkey in September of 2006.
A division of this project looking at oxidative stress and antioxidant status in older exercising horses compared to younger horses was recently accepted for publication in the Journal of Animal Science and is due to come out in print the middle of next year (2008).
We have also investigated the effect of a natural beta-carotene supplement on exercising horses and how that works in combination with vitamin E, which has lead to a manufactured supplement for horses. Along with these projects leading to student honors thesis publications and scientific abstracts presented at society symposia.
We also expanded the scope of this project to include competitive 3-Day Event Horses at the International level event at the Horse Park of New Jersey. This event, the Jersey Fresh event, has top level riders and horses from all over US and Canada. Most of these horses are bound for Olympic Level competition in the near future. At this level these horses are under great stress, but this has never been quantified in terms of nutritional status, and oxidative stress. In June 2006 fifty percent of the 84 horse and rider combinations, and in June of 2007 35 pairs (just under 50%) participated in the 4-day long study. Results were tabulated and a summary was sent to each rider and other personnel involved in the competitive event along with presentations made at scientific society meetings. Meeting proceedings have been written and a manuscript including the results from both years is in the process of being submitted to the Journal of Animal Science.

Results

The vitamin E supplementation portion of this study found that horses supplemented with vitamin E at nearly 10-times the 1989 NRC recommended level did not experience lower oxidative stress compared to control horses. Additionally, there was lower plasma beta-carotene levels observed in the high supplemented group, which may indicate that vitamin E has an inhibitory effect on beta -carotene metabolism. This could save horse owners and trainers a lot of money in the long run if they are able to get away with little to no supplementation of vitamin E as compared to what is commonly supplemented.

The beta-carotene supplementation proved to increase the levels of beta-carotene in the blood of exercising horses over a 4-week period and may prove to be a better, more economical form than the typically supplemented synthetic form. However, more studies will continue to investigate this theory. A follow-up study to this first study looked at a supplement mixture of beta -carotene and other antioxidants in 8 horses pre-and post-exercise. The results here are being written up as an undergraduate honors research project. Funding from the supplement company will allow us to further research this topic.

Results from the Jersey Fresh event have proven the horses of this caliber are undergoing stress during the event; however, many variables go into determining differences between individual horses and each level of competition. Studies from this previous year have also shown that horses are receiving daily amounts of various vitamins and mineral in excess of their daily recommended amounts. These horses are still undergoing inflammation produced during exercise. Theory behind this is that there is a moderate amount of inflammation that is a natural response to the body's exertion during exercise, and completely eliminating this inflammation could be detrimental to the body. Education of horse owners is necessary to help eliminate the over supplementation that we see with so many disciplines, not just exclusively 3-Day Eventers.

4. Associated Knowledge Areas

KA Code	Knowledge Area
302	Nutrient Utilization in Animals
312	External Parasites and Pests of Animals
303	Genetic Improvement of Animals
315	Animal Welfare/Well-Being and Protection
301	Reproductive Performance of Animals

Outcome #2

1. Outcome Measures

Medium Term
Diverse equine-related units are organized into one voice

Misperceptions by the general public re: the segments of equine industry are corrected

All uses of the horse are recognized as agricultural by local and state government officials

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:
Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	25000	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
302	Nutrient Utilization in Animals
312	External Parasites and Pests of Animals
303	Genetic Improvement of Animals
301	Reproductive Performance of Animals
315	Animal Welfare/Well-Being and Protection

Outcome #3

1. Outcome Measures
Long Term
Equine industry is unified and is economically sustainable

Equine industry is recognized as a critical component of the economic development, of traditional agriculture, and the preservation of open space

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:
Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	30000	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Marketing Hay to the New Jersey Equine Industry

The equine industry in New Jersey is one of the fastest growing agricultural sectors with nearly twenty-percent of the states agricultural lands dedicated to equine operations (2007 Equine Industry Survey). The increased popularity of the equine industry in the state has provided hay producers a new market for their hay. Approximately 46,000 of the states 115,000 hay acres are dedicated to supplying the equine industry. While the steady increase of the equine industry offers a tremendous opportunity for hay producers, the demands of the equine industry are different than traditional animal operations. Furthermore, equine producers traditionally do not produce agricultural crops and have little understanding of the costs associated with producing quality hay. Agricultural production in New Jersey is very expensive with the countries third highest land prices, high production costs and high labor wages. Maintaining a successful agricultural enterprise in New Jersey requires that producers have a strong understanding of the marketing opportunities in the region.

What has been done

In 2006, the Rutgers University Animal Science Team (RUAST) was established to provide the New Jersey animal industry with non-biased, research based information to help improve productivity and to promote sound environmental management of animal operations in the state. In 2006 the RUAST began a series of educational programs dedicated to improving the quantity and quality of New Jersey grown hay specifically for the equine industry. Programs were held at several locations across the state and included programs for hay producers and consumers. Programs were continued in 2007 and focused on developing linkages between hay producers and equine consumers. Programs included, Marketing Hay to the Equine Industry, hay Production and Marketing, Hay Day, a program for youth and adults. Programs featured specialists from out of state specializing in production utilization and marketing. Agents involved established a forage assist team, consisting of specialists in animal production, crop production and marketing. This team conducted several site specific field visits to assist producers with issues affecting hay quality. These site evaluations stimulated the forage team to initiate replicated research trials to address many production issues. Program participants were surveyed to determine the effectiveness of program efforts and research projects included an economic analysis.

This program focused on two separate groups, the equine consumer and the hay producer. Programs consisted of formal classroom instruction, practical hands on training and through take-home evaluations. Evaluations were conducted to determine if programs were meeting the needs of the clientele and to assess future program needs.

Results

Extension programs were well attended with an average of seventy participants per program. Approximately forty-percent of the attendees completed the program survey. Respondents reported gaining a better level of understanding of hay production practices. Thirty-two percent of respondents reported a change in hay feeding practices based on the information presented in programs. This change resulted in an average 11.5 % increase in total hay fed based on survey results. Fifty-six percent of consumers reported a willingness to pay an average 11.5 % premium for locally produced, high quality hay. This translates to a $0.42 to $0.49 premium per bale based on consumers reported hay prices and a potential $ 2 million impact to the New Jersey hay industry. Producers reported gaining a better understanding of consumer needs and in hay production practices including: 33% performing soil tests, 17% reporting a plan to conduct soil tests according to university recommendations. Research conducted determined that an $80 per acre return could be realized by treating for one insect pest common in timothy, a hay heavily demanded by the equine industry. This research program demonstrated a protocol which, if followed in 50% of the state's 45,000 acres, could result in $1.8 million additional gross revenue for hay producers while ensuring an adequate supply of high quality hay for the industry.

4. Associated Knowledge Areas

KA Code	Knowledge Area
302	Nutrient Utilization in Animals
315	Animal Welfare/Well-Being and Protection
303	Genetic Improvement of Animals

Outcome #4

1. Outcome Measures

Short Term New Jersey residents and government officials will be made aware of the importance of the equine industry Equine enthusiasts take leadership roles to unify the industry and will acquire knowledge to support the industry's sustainability Equine industry segments will learn the importance and benefits of speaking in one voice

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

New Jersey 4-H Horse Program

The New Jersey Equine Industry is a huge economic force in the state with over $3.5 billion in property and animals. It generates $1.1 billion in revenue for the state annually. If the industry is to remain viable in the future, there is a need to educate young people about all aspects of the equine industry from leisure riding to horse racing as well as the opportunities in this state for jobs in related industries like pharmaceuticals, feed production, veterinary, etc.

What has been done

The New Jersey 4-H Program utilizes adult volunteers, educational workshops, events and curriculum to educate youth about a variety of topics related to the Equine Industry. Youth grades 1- 13 (one year out of high school) in every county in New Jersey have the opportunity to participate in the 4-H Horse project. In the 4-H year 2006-2007, 1,698 youth participated in the New Jersey 4-H Horse Program. Nearly every county in the state has at least one 4-H Club with horse project members and most of the counties participate in county and state workshops and competitive events related to Equine.

On the state level the following events were conducted with the help of statewide volunteer committees:
-Model Horse Show - 25 members from 5 counties participated.
-State Horse Bowl -126 youth from 11 counties participated in this state competition. One four-member team was selected to represent New Jersey at the Eastern National 4-H Horse Round Up in KY, November 2-4, 2007
-New Jersey 4-H Horse Judging and Hippology contests. In Hippology, 76 youth from 11 counties participated in this competition. One four member team competed at the Eastern National Round Up in Kentucky in November. In Horse Judging 73 youth from 11 counties participated in the State contest. Four of these youth were selected to represent New Jersey in the Eastern National 4-H Horse Round Up competition.

-Equine Presentations - 29 youth from 11 counties participated in this State Competition. Two members were selected to represent New Jersey at the Eastern National 4-H Horse Round Up competition in Louisville, KY.

- State 4-H Horse Show - 990 total entries submitted by 300 youth from 12 different counties in New Jersey. By discipline: Dressage - 114; Driving - 33; Games - 140; English - 346; Western - 274; and Challenged - 2.

- State 4-H Trail Ride - 42 riders representing 8 counties.

Results

Prior to competing in any of these events, 4-H youth participate in months of studying, riding and learning about the horse and related industries at club meetings, team practices, county and state workshops and on an individual basis. Youth learn physiology of the horse including the digestive, skeletal, and reproductive systems. They learn how to speak in public, research a topic and present it to others. They learn decision making skills and how to defend their decision to a judge or official. They learn one or more styles of riding and how to compete (win or lose) with grace and composure.

Individual impacts reported by the participants included the following results:
Hippology
-100% agreed that Hippology taught them about the horse.
-94% agreed that Hippology taught them to be team players.
-94% agreed that Hippology taught them how to be better listeners.
-80% agreed that Hippology taught them public speaking skills.
-78% agreed that Hippology taught them about ethics.

Horse Judging
-94% agreed that Horse Judging taught them about public
-92% agreed that Horse Judging taught them about ethics.
-90% agreed that Horse Judging taught them about being a better listener to directions.
-88% agreed that Horse Judging taught them about being a team player.

State 4-H Horse Show
The percent of youth participants which reported learning the following skills from the State 4-H Horse Show was:
Time management 22%
Patience 22%
Sportsmanship 15%
Team Work 13%
Confidence 10%
Responsibility 6%
Cooperation 6%
Other 6%

State 4-H Trail Ride
Participants in the State 4-H Trail Ride reported the following impact as a result of the event:
Helped me gain confidence. 66%
Made me be more responsible and disciplined. 63%
Improved my teamwork skills. 71%
Improved my goal setting skills. 63%
Improved my organization skills. 56%
Helped me gain knowledge of horse care and management practices. 62%
Encouraged me to continue trail riding. 66%

4. Associated Knowledge Areas

KA Code	Knowledge Area
303	Genetic Improvement of Animals
301	Reproductive Performance of Animals
312	External Parasites and Pests of Animals
315	Animal Welfare/Well-Being and Protection
302	Nutrient Utilization in Animals

Outcome #5

1. Outcome Measures

Long Term Equine industry is unified and is economically sustainable Equine industry is recognized as a critical component of the economic development, of traditional agriculture, and the preservation of open space

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:
Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Mid-Atlantic Equine Pasture Initiative

There is an inadequate number of knowledgeable advisors for the large and widespread equine community. The goal of the "The Mid-Atlantic Equine Pasture Initiative" (MAEPI) is to train extension agents, governmental agency employees, and other industry professionals to serve as informed field consultants and advisors to horse farm owners and managers in New Jersey and the Mid-Atlantic region. Also, there are both new and established horse farm owners who need updated pasture management information to more successfully begin and sustain their operations.

What has been done

The essential elements of this 2007 pasture project included conducting two training meetings in Central NJ, holding Open Houses on campus and the developing of training materials, as well as summarizing a list of resources accessible via web sites and video. Program participants were provided with free soil test kits along with instructions how to conduct a soil sample properly and understand the subsequent analysis.

The objectives over a 3-year period were to increase outreach and assistance to this clientele, improve their knowledge, and adoption of practices that improve pasture quality, reduce environmental impact and sustain equine operations.

Our projects to make this program successful included the two Training Sessions in Monmouth County completed in October 2007. One session was held in our county extension office and the other was held outdoors at Stargate Horse Farms. Attendees at our training sessions were provided with a training module, which included fact sheets from the participating universities on all aspects of pasture management. The module also came with a CD curriculum containing electronic copies of the fact sheets, evaluations for our project individual pasture programs, and nine PowerPoint presentations with detailed notes to serve as a script. The nine presentations included topics on importance of pasture to horses, soil fertility, manure management, forage species ID and selection, forage growth and rotational grazing, plants toxic to horses, weed control, pasture renovation, and environmental concerns with equine operations. The curriculum was also provided for sale in a cost-recovery portion of this program.

The audience consisted of equine field consultants, agronomic advisors, horse farm owners, horse farm managers and horse owners. This cohesive community was very involved in interacting and contributing to these timely sessions in equine pasture management. Complete satisfaction was verbally conveyed by all attendees and our preliminary client surveys have documented this very high level of satisfaction.

Results

Our outcomes of the 2006 program were evaluated by each participant at the end of the training and 1 year later (2007). The evaluations asked the participants to rank each category on a scale of 1 to 5 with 5 being the most valuable. After the training the attendees felt the training module with PowerPoints was the most valuable portion (4.7). Attending the training session ranked second (4.6), followed by the availability of fact sheets (4.4) and the opportunity to create a network of pasture professionals (4.3). The individual PowerPoints scored from 4.1 to 4.7. When the attendees were asked to list their plans of developing equine pasture programs, 43 % commented that they planed on hosting a workshop, seminar or short course based on the materials within the next year. Fifty percent are going to host more informal twilight meetings or pasture walks and more than half will write fact sheets, popular press articles, or dedicate a section of an existing newsletter, or develop a new newsletter on what they have learned at the training. Almost all of the attendees listed that they planned on taking more calls and answering more questions one on one to equine producers regarding pasture management.

After a year of working with the module the attendees felt the fact sheets were the most valuable portion on the CD (4.4). The evaluation score for attending the actual training session (4.0) their opportunity to create a network of pasture professionals (3.3) decreased due to not all survey participants attending the training session. Participants evaluated each PowerPoint presentation again after the year of being able to use them in their own programs and the scores ranged from 3.8 to 4.3 with "Horse Health and Pasture Importance" being the highest ranked presentation. Client evaluations from this 2007 program were again conducted at the two October sessions in a similar manner as 2006 and are in the process of being compiled and analyzed.

Over 70 soil tests were conducted by this year's program participants were analyzed by the Rutgers Soil Lab. Nutrient recommendations by this county agent maintained proper nitrogen, potassium and micronutrient levels and significantly reduced the phosphorus levels that were found to be in excessive amounts in most of the soils tested.

4. Associated Knowledge Areas

KA Code	Knowledge Area
312	External Parasites and Pests of Animals
301	Reproductive Performance of Animals
302	Nutrient Utilization in Animals
303	Genetic Improvement of Animals
315	Animal Welfare/Well-Being and Protection

Outcome #6

1. Outcome Measures

Long Term - Equine industry is unified and is economically sustainable Equine industry is recognized as a critical component of the economic development, of traditional agriculture, and the preservation of open space

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Impact of the Equine Industry on the Economy, and the Preservation of Open Space and Traditional Agriculture in New Jersey

In New Jersey, where the horse is the state animal, the equine industry is invaluable as a major factor in retaining agricultural acreage as open space. Although horse owners do not market their product by the bushel, pound, or cubic foot, horses are bred, raised, bought and sold in the Garden State like any other agricultural commodity. The horse industry in New Jersey is represented on the State Board of Agricultural, where policymaking decisions affecting agriculture are made. However, the future of New Jersey's equine industry is in jeopardy as the racing industry faces serious challenges from competition from other gaming options; both in and out of state. The ESC believes that the state of New Jersey, where there are more horses per square mile than in any other state, has minimized the importance of the equine industry and that now is the time to correct the oversight. Economic development processes exist for casinos, tourism, agriculture and food industries, and health care, but not for equine. The reality is that the equine "industry" is not perceived to be an industry at all. Because of its diversity, the horse industry has many factions which do little to communicate and unify their voices. Hence, key agency leaders and the New Jersey legislature find it hard to respond to an industry which sends so many mixed messages. The biggest challenge faced by the entire horse industry is to support all aspects of this diverse industry in one common, unified voice. There is a dire need for science-based information to document the socio-economic importance of the New Jersey equine industry and to develop the tool-kit needed to educate residents of the state, including policy decision makers about its importance.

What has been done

- In 2006-2007, the Rutgers Equine Science Center conducted economic and land use impact analysis of the horse industry in New Jersey, in partnership with other state agencies and industry breed groups. More than producing just a census, the ESC team conducted analyses which determined the impact of the racing segment on the overall horse industry and collectively the impact of the entire horse industry on traditional agriculture and open space. The purposes of this study were to conduct an economic and land use impact assessment; to begin regular benchmarking of the industry; to profile all components of the state's equine industry, including pleasure & sport/recreation; and to go beyond a simple enumeration.

--- The materials and methods were as follows: In cooperation with NASS, the equine industry was surveyed in 2006. Target population included: operations in NJ with any equine, horse owners in NJ who do not keep animals on-site, major NJ racetracks (supplementary survey by Rutgers team). Survey sample was as follows: 9.949 pieces mailed, 3,400 responded, random geographic contacts, 4 racing venues, 2,050 were summarized. Respondents included: breeding, competition, boarding, and training facilities; facilities offering riding or lessons; horse owners keeping animal(s) at residential property; horse owners boarding animals(s) elsewhere; non-equine farms that have horses.
- Categories of questions asked: Type of operation, acreage devoted to structures, pasture, hay, etc., total asset value of operation and livestock. Equine inventory by major breed categories and by primary use. Equine-related income and expenditures and demographic data
---Economic impact analysis was conducted using IMPLAN: A quantitative model of the New Jersy economy, used to measure both direct and indirect impact. Land use analysis was determined by operation acres, estimated using survey data and aerial photography cross-check; as well as support acres measured by animal nutritional requirements estimate, other sources of forage acres and a Cooperative Extension hay survey.
--How much hay is imported?

Outreach Efforts:
- Video and presentation materials
- Educational campaign statewide
    - Press Conference and State-wide Presentations
- Educational material mailings to legislators
- Conducted a two-day short course, working with stakeholders and undergraduate and graduate students to discuss the issue and to discuss solutions.

Audience is all residents of New Jersey. Specifically, horse industry leaders and horse breeders and owners, users, facility owners, and owners of traditional agricultural facilities in support of horses, i.e., hay, grain and straw farmers were targeted when developing the educational program tools and methods. A train the trainer approach was used. Also targeted with research information were legislators in need of current, science-based information on the significance of the horse industry in New Jersey. Meetings with funders, other stakeholders, legislators and the media have acknowledged the value of the study and of the outreach materials and educational meetings conducted.

Results

The New Jersey equine industry, valued at $4 billion, produces an annual economic impact of $1.1 billion comprised of the $647 million spent by New Jersey equine owners and operators of equine facilities and $502.3 million from racetracks. The industry employs 13,000 persons and generates $160 million in federal, state, and local taxes. Horses are found on 7,200 facilities in every county statewide. Besides the economic importance of the industry, these 7,200 horse facilities maintain open space of 176,000 acres, and an additional 46,000 acres in non-equine use, to produce hay, grain, and bedding in support of horses. These in turn provide an enhanced quality of life for New Jersey residents. Horse operations tend to be more sustainable than other types of agricultural businesses, making the horse industry critical to the growth and land-use strategy of the state. Meetings with funders, other stakeholders, legislators and the media have acknowledged the value of the study and of the outreach materials and educational meetings conducted.

4. Associated Knowledge Areas

KA Code	Knowledge Area
315	Animal Welfare/Well-Being and Protection

Outcome #7

1. Outcome Measures

Long Term: Equine industry is unified and is economically sustainable Equine industry is recognized as a critical component of the economic development, of traditional agriculture, and the preservation of open space

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Strongyle Parasites Impact on Animal Health

Rainfall and low-lying regions in the field are factors in strongyle infection in horses. Actively managing pastures can reduce these infections and reduce parasite loads.

Out of approximately 100 species of internal parasites that infect horses, half are due to strongyle species. Of those, the small strongyle species are widely prevalent in almost all parasite burdens in U.S. horses. There are only a few types of drugs to combat strongyle infection, and drug resistance in small strongyles is increasing for certain anti-parasitic drug classes. These parasites are a big economic problem on domestic animal farms, since strongyle infection is a factor in colic, which costs $115 million annually in health costs to horse owners. This project investigates environmental and topological features that lead to aggregation of strongyles on pastures.

What has been done

Research at NJAES determined the effects of rainfall and field topography on the distribution of the infective larvae of strongyle parasites on pastures in New Jersey. By using GIS to create elevation maps of horse pastures on Cook College, and hydrological models were applied to identify run-off patterns on those field. This study looked at parasite distribution on fields using GIS to create elevation maps of pastures on Cook College, and hydrological models to identify run-off patterns on those field.

Results

Infective larvae begin to appear in the field after rainfall begins, and that the highest accumulations occur in the low regions of the field. By being aware of the appearance of infective larvae in low areas and in rainfall, horse owners and managers can actively manage pastures to lessen the interaction with infective strongyle larvae, and subsequent incidence, of strongyle worm infections in their horses. These results also provide information for better pasture hygiene for non-drug prevention and management of strongyle infection, lessening the use of small strongyle anti-parasitic drug classes for which drug resistance is increasing.

4. Associated Knowledge Areas

KA Code	Knowledge Area
312	External Parasites and Pests of Animals
315	Animal Welfare/Well-Being and Protection

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought,weather extremes,etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programatic Challenges
- Populations changes (immigration,new cultural groupings,etc.)

Brief Explanation

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- Before-After (before and after program)
- During (during program)
- Time series (multiple points before and after program)
- Comparisons between program participants (individuals,group,organizations) and non-participants
- Comparisons between different groups of individuals or program participants experiencing different levels of program intensity.
- Comparison between locales where the program operates and sites without program intervention

Evaluation Results

Evaluation results are unique to each program. See Qualitative Outcome Statements.

Key Items of Evaluation

Program #7

V(A). Planned Program (Summary)

1. Name of the Planned Program

Home, Garden and Environment

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
205	Plant Management Systems	100%		100%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2007	Extension		Research	
	1862	1890	1862	1890
Plan	3.0	0.0	0.0	0.0
Actual	24.0	0.0	2.7	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
367492	0	99595	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
1446008	0	73423	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
418879	0	73631	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Identify critical programmatic foci/needs based on Extension and stakeholder assessment broadly defined under two areas:

Environmentally sound gardening/lawn care:
- Home horticulture – lawn, garden and grounds management
- Commercial horticulture - professional management and maintenance

Environmentally sound household, structural pest control
- Home pest control – termites, carpenter ants, etc.
- Human-heath related pest control – mosquitoes, ticks, etc.
- A school IPM program will be developed to train end-users sound management techniques,

Develop an inventory of local (county based) and regional and statewide programs designed to meet these needs.

Identify team members and their roles.

Create a multi-task effort to generate and share research-based information with clientele, including research, demonstrations, educational meetings and workshops, certification programs, trainings, etc.

2. Brief description of the target audience

Stakeholders:
- Homeowners and residential clientele
- Commercial horticulture professionals (management and maintenance)
- Commercial pest control operators
- Public health officials
- Municipalities and other governmental and non-governmental agencies, including Parks Commission, Public Health, Mosquito Commission, schools, etc.
- Local environmental commissions or others that have interest in these areas

Volunteers (trained via Master Gardener Program, Environmental Stewards Program), youth and others who can support and benefit from these efforts

Underserved and underrepresented audiences

V(E). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	**Target**	**Target**	**Target**	**Target**
Plan	20000	6700	200	60
2007	20164	0	770	0

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year	Target
Plan:	0
2007 :	0

Patents listed

PP17,768 issued 5/29/07 for a new dogwood cultivar, cornus saturn.

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan			
2007	0	18	18

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Master Gardeners training sessions, 9 non-refereed journal proceedings, 7 extension publications in popular press, 11 profess

Year	Target	Actual
2007	{No Data Entered}	0

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O No.	Outcome Name
1	Short Term Increased knowledge and improved decision making skills of professionals and volunteers (Master Gardeners and Environmental Stewards) working in commercial horticulture professions (management and maintenance), commercial pest control operators, public health officials, municipalities and other governmental and non-governmental agencies Increased number of trained youth and adult volunteers, and measurable impact of their assistance on clientele. Increased number of certified pest control operators. Increased number of youth and adult clientele utilizing Extension information and service to improve their own and others knowledge and decision making skills.
2	Medium Term Educated youth and adult clientele, both professional and residential, utilize their newly gained knowledge and skills to implement and make changes such as: · Efficient and effective pest control techniques · Proper utilization of fertilizers and other soil amendments as needed based on soil testing · Proper selection of plant materials to reduce need for chemical inputs · Reduction in the damage caused by structural pests · Reduction in health related incidents and costs association with human health vectors (ticks, mosquitoes). · Protect health and safety of school children. · Enhance or maintain environmental quality
3	Long Term New Jersey's residents will reside, work and play in a healthy, safe, and sound environment -- in their homes, gardens, schools, parks and workplaces.
4	Short Term Increased knowledge and improved decision making skills of professionals and volunteers (Master Gardeners and Environmental Stewards) working in commercial horticulture professions (management and maintenance), commercial pest control operators, public health officials, municipalities and other governmental and non-governmental agencies Increased number of trained youth and adult volunteers, and measurable impact of their assistance on clientele. Increased number of certified pest control operators. Increased number of youth and adult clientele utilizing Extension information and service to improve their own and others knowledge and decision making skills.
5	Short Term Increased knowledge and improved decision making skills of professionals and volunteers (Master Gardeners and Environmental Stewards) working in commercial horticulture professions (management and maintenance), commercial pest control operators, public health officials, municipalities and other governmental and non-governmental agencies Increased number of trained youth and adult volunteers, and measurable impact of their assistance on clientele. Increased number of certified pest control operators. Increased number of youth and adult clientele utilizing Extension information and service to improve their own and others knowledge and decision making skills.
6	Short Term Increased knowledge and improved decision making skills of professionals and volunteers (Master Gardeners and Environmental Stewards)working in commercial horticulture professions (management and maintenance), commercial pest control operators, public health officials, municipalities and other governmental and non-governmental agencies Increased number of trained youth and adult volunteers, and measurable impact of their assistance on clientele. Increased number of certified pest control operators. Increased number of youth and adult clientele utilizing Extension information and service to improve their own and others knowledge and decision making skills.

7	Short Term Increased knowledge and improved decision making skills of professionals and volunteers (Master Gardeners and Environmental Stewards) working in commercial horticulture professions (management and maintenance), commercial pest control operators, public health officials, municipalities and other governmental and non-governmental agencies. Increased number of trained youth and adult volunteers, and measurable impact of their assistance on clientele. Increased number of certified pest control operators. Increased number of youth and adult clientele utilizing Extension information and service to improve their own and others knowledge and decision making skills.
8	Short Term Increased knowledge and improved decision making skills of professionals and volunteers (Master Gardeners and Environmental Stewards) working in commercial horticulture professions (management and maintenance), commercial pest control operators, public health officials, municipalities and other governmental and non-governmental agencies. Increased number of trained youth and adult volunteers, and measurable impact of their assistance on clientele. Increased number of certified pest control operators. Increased number of youth and adult clientele utilizing Extension information and service to improve their own and others knowledge and decision making skills.

Outcome #1

1. Outcome Measures

Short Term

Increased knowledge and improved decision making skills of professionals and volunteers (Master Gardeners and Environmental Stewards) working in commercial horticulture professions (management and maintenance), commercial pest control operators, public health officials, municipalities and other governmental and non-governmental agencies

Increased number of trained youth and adult volunteers, and measurable impact of their assistance on clientele.

Increased number of certified pest control operators.

Increased number of youth and adult clientele utilizing Extension information and service to improve their own and others knowledge and decision making skills.

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	13000	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Tending the Garden State - the 2007 Statewide Master Gardener Continuing Education Program.

Initiated in 1984, Rutgers NJAES Extension faculty and staff have facilitated and supported the Master Gardener Volunteer Program, training willing citizens to become horticultural educators and outreach ambassadors for Rutgers in meeting the needs of the general public in areas of horticulture and landscape management. In 2003, Rutgers implemented statewide policies and procedures that stipulated annual continuing education requirements for members of this volunteer corps. This would not only work to keep current the knowledge base from which our Master Gardeners would work from, but also ensure that the public and clientele of the Master Gardeners would be receiving quality and current information. This 10-hour training requirement for continuing certification as a Master Gardener has also revitalized the excitement and enthusiasm of long time Master Gardeners, who are once again learning new things as they once did as members of the incoming class.

What has been done

Master Gardener Advanced Training - Continuing Education Sessions. Three regional training sessions were held for 174 current Master Gardener volunteers in 2007. Presentations included successful volunteerism, climate change related to pest and disease outbreaks, updates on ornamental, structural and household pests, using and identifying native plants in the landscape, weeds as indicators for turf management requirements, rain gardens and residential storm-water management, and climate trends and changes and their effect on weed, pest and disease outbreaks.

Results

A majority of attendees at the regional training session (80%) stated they increased their knowledge and personal practice of pest management and IPM techniques, how the weather affects pest and disease incidence and severity, the need to avoid "routine" fertilizer applications, improve their general lawn and tree care practices, the importance and significance of properly designed and located rain gardens, and how to minimize their landscape's water requirement through diverse plantings (selection) and proper plant placement.

Master Gardener Program trains volunteers who assist Cooperative Extension in its mission to deliver science-based and environmentally-sound horticulture and related information to the general public. Trained participants expand their knowledge of horticulture, home pest control, environmental issues, and other related topics through 60 hours of training and 60 hours of volunteering and associate activities. Upon completion of their training, Certified Master Gardener volunteers engage in service in local outreach programs and must continue to do so as required to maintain their active status. In 2006, 18 county-based programs trained 328 new Master Gardener interns. A total of 1,760 Certified Master Gardeners volunteered 122,946 hours during the year, valued at nearly $2.7 million. Established in 1984, the program has trained 4,381 residents who have provided 1.08 million volunteer hours valued at $19.8 million.

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems

Outcome #2

1. Outcome Measures

Medium Term

Educated youth and adult clientele, both professional and residential, utilize their newly gained knowledge and skills to implement and make changes such as:

· Efficient and effective pest control techniques

· Proper utilization of fertilizers and other soil amendments as needed based on soil testing

· Proper selection of plant materials to reduce need for chemical inputs

· Reduction in the damage caused by structural pests

· Reduction in health related incidents and costs association with human health vectors (ticks, mosquitoes).

· Protect health and safety of school children.

· Enhance or maintain environmental quality

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	35000	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The NJ Urban Forestry Academy

The New Jersey Bureau of Forestry's assessment of the state's tree health and maintenance problems pointed out the need for qualified managers and an infusion of labor to preserve, maintain and enhance our natural tree resources. In addition, local tree care and landscape firms are continually searching for seasonal and full-time employees to better service their clientele. Additionally, New Jersey Youth Corps (NJYC) sought vocational and experiential training to develop job skills, better personal decision-making, and increased employability for their clientele throughout the state. In building upon the past four years programming efforts and evaluations, Agent Polanin worked to streamline the program within the constraints of a restructured NJYC to provide this program to youth clientele already enrolled in their Brownfields Technician Training program. This program was initiated in 2000 as a pilot program

What has been done

This experiential workforce preparation program for youth seeking employment opportunities within New Jersey's tree care and landscape industries was initiated in 2000. All 13 New Jersey Youth Corps offices (Asbury Park, Camden, East Orange, Jersey City, Newark, Paterson, Phillipsburg, New Brunswick, Trenton, and Vineland, NJ) were included in the training. This effort affords the youth training and employment opportunities while also building on the New Jersey Youth Corps' models of leadership and citizen development.

In partnership with the NJ Youth Corps and the NJ Department of Labor, four sessions were facilitated for 118 youth throughout the state in 2007. Sessions were held at the Atlantic County 4-H Association property (southern regional), Millburn and Maplewood Township DPW properties (northern regional) and twice at the Somerset County RCE office (central regional). Classroom and hands-on field training sessions included basic tree biology, basics of tree care and landscape maintenance, general safety and personal protective equipment, landscape ecology, aerial operations / climbing and bucket work, tree identification, chipper use, tree fertilization and spraying techniques.

Participants in the NJ Youth Corps program within the NJ Department of Labor are young adults between the ages of 16 and 25, who have left high school without earning their diplomas. NJ Youth Corps is a year-round program that helps to provide young people with a second chance to earn their diplomas while developing necessary employment skills through meaningful community service. It also serves low income, minority, at-risk populations

Results

One participant from the 2007 program was accepted for employment by Lewis Tree Experts, a national line clearance tree trimming company. Average skill evaluations for the 4 sessions held in the 2007 program (n=118) revealed:

* 30% displayed the proper safety techniques in ascending a tree utilizing rope and saddle, working from the top of a ladder, or aerial lift, a 70% increase from pre-test results
* 36% exhibited a working knowledge of tying-in and other fall-prevention measures when working in and around trees, a 300% increase from pre-test results
* 40% identified potential electrical hazards and detailed necessary safety measures and precautions when working near electrical lines, a 95% increase from pre-test results
* 80% identified the causes of chainsaw kickback and how to prevent it, a 30% increase from pre-test results
* 90% exhibited a working knowledge of proper pruning methods, a 100% increase from pre-test results

Specific evaluations of the participating youth (n=118 for 2007) revealed:
* 66% are considering a career in the green industry
* 100% would recommend the training to other potential participants
* 92% would use or share their new knowledge even when following another career choice
* 78% rated the overall program as "Very Good" or "Excellent"

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems

Outcome #3

1. Outcome Measures

Long Term
New Jersey's residents will reside, work and play in a healthy, safe, and sound environment -- in their homes, gardens, schools, parks and workplaces.

2. Associated Institution Types

•1862 Research

3a. Outcome Type:
Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	40000	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Patent Awarded to New Dogwood Cultivar

The nursery industry in New Jersey is one of the largest agricultural industries, with gross receipts in excess of $300 million. The nursery industry is constantly seeking new and superior, or unique, cultivars of ornamental trees and shrubs, such as holly and dogwood to provide superior cultivars for economic benefit to the industry. Also in demand are new cultivars that have lower maintenance requirements and reduced need for the use of harsh chemical pesticides in residential or public areas.

What has been done

Researchers at NJAES have evaluated selected seedlings of new and superior clones of advanced generation interspecific hollies (Ilex) and dogwood (Cornus) for introduction to commerce. From this collection, a significan number of genotypes have been identified that express a very high level of resistance to eastern filbert blight (EFB), as well as later flowing; the traits necessary for reliable and productive growth in the northeastern US. Incorporating a number of different valuable ornamental attributes, such as contorted growth habit, weeping branches, purple leaf color, serrated leaves, peeling bark, and attractive fall color into these advanced EFB resistant lines will allow for the development of new, low-maintenance woody ornamentals for this region. Currently, nearly 11,000 seedlings and clonal selections of hazelnuts are under evaluation at Rutgers, with approximately 5,000 of these the result of controlled hybridizations.

Results

In 2007, the project investigator was awarded a patent for a new dogwood cultivar, Cornus Saturn. In addition, Cornus Venus, developed in this project, was selected as a 2007 winner of the Pennsylvania Horticultural Society's Gold Medal Plant Award. Also, in 2007, Cornus Venus received a Thomas Alva Edison Patent Award from the Research and Development Council of New Jersey.

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems

Outcome #4

1. Outcome Measures

Short Term Increased knowledge and improved decision making skills of professionals and volunteers (Master Gardeners and Environmental Stewards) working in commercial horticulture professions (management and maintenance), commercial pest control operators, public health officials, municipalities and other governmental and non-governmental agencies Increased number of trained youth and adult volunteers, and measurable impact of their assistance on clientele. Increased number of certified pest control operators. Increased number of youth and adult clientele utilizing Extension information and service to improve their own and others knowledge and decision making skills.

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Pesticides and the Environment

Endocrine disrupting chemicals found in the environment can have long-lasting consequences on reproductive organs in mammals and aquatic species

There is increasing concern that chemicals which find their way into the environment, such as endocrine disruptors, can and have been adversely affecting the development of reproductive organs in certain animals, leading to impaired reproductive efficiency in adult life and in subsequent generations. For example, methoxychlor is a common insecticide used in agricultural operations, but can function as a xenoestrogen, disrupting the endocrine systems and estrogen-sensitive tissues, such as reproductive organs. In order to help address this growing concern and in recognition of the importance of the issue in protecting wildlife and human health, the Environmental Protection Agency published draft policies and procedures for the Endocrine Disruptor Screening Program to help screen for chemicals that can affect the endocrine systems of animals, including farm animals and aquatic species.

What has been done

At NJAES, faculty members are examining the effects of certain endocrine disruptors on organ development and female fertility in mammals, as well as organ development in aquatic species. The effect of methoxychlor on ovarian development, function and subsequent fertility of the parent and offspring is being investigated in mammalian models, namely farm animal species. These experiments will be done over the life of the animals, starting with exposure to methoxychlor during fetal development. For the aquatic species, field studies combined with histopathological techniques will be employed to evaluate organ lesions, as a sign of organ disruption by the chemicals, such as widely used fungicides and herbicides. In soils, the researchers measured the sorption of male hormones on soils and sediments and examined the degradation rates of hexachlorocyclichexanes (HCHs) and pentachlorophenols (PCPs) in the presence of minerals.

Results

The research studies demonstrate that exposure to methoxychlor (MXC) during fetal and neonatal ages has detrimental effects on adult ovarian function and reproductive parameters, by inhibiting the promotion of ovary follicle maturation, as well as stimulating their inhibitory regulators. Exposure to MXC in fetal and neonatal stages disrupts alters ovarian gene expression and follicle creation and may lead to impairment of ovarian function and female fertility. For aquatic species, the use of common fungicides affected the central nervous system of fish, for the first time demonstrating that these chemicals target the neurons associated with Parkinson-like syndromes. New laboratory data on the treatment of HCHs found in aquatic systems show that in the presence of FeS, the half-life of this endocrine-disrupting chemical was reduced by over 70%, providing a method for improved environmental remediation.

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems

Outcome #5

1. Outcome Measures

Short Term Increased knowledge and improved decision making skills of professionals and volunteers (Master Gardeners and Environmental Stewards) working in commercial horticulture professions (management and maintenance), commercial pest control operators, public health officials, municipalities and other governmental and non-governmental agencies Increased number of trained youth and adult volunteers, and measurable impact of their assistance on clientele. Increased number of certified pest control operators. Increased number of youth and adult clientele utilizing Extension information and service to improve their own and others knowledge and decision making skills.

2. Associated Institution Types

•1862 Extension
•1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Natural Resources/Environment

Invasive plants pose a serious threat to biodiversity, yet information on their biology is lacking; limiting resource manager's ability to respond to often economically - expensive problems. By training volunteers to collect biologically significant data, it can be possible to resolve the issue of labor in dealing with invasive plants, while promoting scientific literacy. The purpose of this project is to investigate the use of trained citizens as a measure of early detection of invasive plant species.

What has been done

Invasive species distribution and a predictive model for risk of weedy plan invasions was created using based on validated citizen-observed characterizations of invasive plant distribution relative to environmental and landscape charateristics. In order to measure how participation in this project affected volunteer understanding of science, training sessions were held and volunteer responses were evaluated.

Results

The model will assist managers in their efforts to curb the spread of invasive plants by informing trail placement decisions and identifying trail environments most a risk of invastion. Volunteers of the project reported 20% increase in project knowledge, with smaller increases in science process skills and behavioral change. About 10% of our participants indicated that they are participating in eco-management or educational outreach. Taken together, another 50% have changed their behavior in some way (e.g., not buying invasive plants, telling others about plant invasions, etc.)

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems

Outcome #6

1. Outcome Measures

Short Term Increased knowledge and improved decision making skills of professionals and volunteers (Master Gardeners and Environmental Stewards)working in commercial horticulture professions (management and maintenance), commercial pest control operators, public health officials, municipalities and other governmental and non-governmental agencies Increased number of trained youth and adult volunteers, and measurable impact of their assistance on clientele. Increased number of certified pest control operators. Increased number of youth and adult clientele utilizing Extension information and service to improve their own and others knowledge and decision making skills.

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Internet Technologies for Distance Education: Online Pesticides Safety Training and Recertification for Licensed Professionals.

Rutgers Cooperative Extension faculty and staff, in conjunction with NJDEP, have provided numerous training sessions for licensed pesticide applicator professionals in general pesticide handling and safety, and in many specialty categories. Modern life has constrained available time audiences can afford to attend traditional seminars, workshops, and other outreach programs. At the same time, licensed professional pesticide applicators require new, efficient and timely delivery systems to provide easy access to educational information and regulatory updates leading to a more successful licensing and re-certification procedure. Rutgers NJAES needs to enhance teaching, research and outreach efforts with the use of new technologies in digital media and the Internet. There is an overwhelming need to provide quality research-based information to help resolve critical issues facing agriculture, urban and rural communities, and the environment. Distance education efforts utilizing enhanced communication linkages reach existing and under-served clientele groups by facilitating distribution of research-based findings, educational opportunities, and regulatory updates. Issues such as capacity building, career development, and environmental justice must be addressed through interactive capabilities to inform a potentially unlimited general audience, while also providing specific educational opportunities for agricultural producers and licensed clientele groups.

What has been done

This project team developed a web site, www.recert.rutgers.edu, dedicated to training and providing continuing education credits on the proper use and storage of pesticides and the selection, use and storage of personal protective equipment. In so doing, this site provides 2 (two) license recertification credits for commercial growers and applicators in NJ. Credits vary for NY and PA, as they assign continuing education credits according to their regulations. The web site, officially launched in June of 2002, edited in 2003, and incorporating new features and learning modules in 2004, features written and narrated script along with digital imagery designed for general audiences, growers and licensed commercial and agricultural applicators to attain Core credits. Two separate modules are currently available for viewing and provide CORE (general pesticide safety) recertification credits for NJDEP licensed applicators and additionally for licensed applicators in NY and PA. Credits are available within each 12 month period (based on initial use by individual user), and a complete 1-hour module is available for general instruction use.

Results

1. 2007 activity for online CORE recertification credits through www.recert.Rutgers.edu totaled 25 commercial applicators, for a program total of 186 online commercial applicators since the site launched in 2002. In addition to the online self-instruction, 105 commercial and agricultural licensed applicators were trained in 2007 using the online learning module in a group teaching format.

* Pre- and post-evaluative questionnaires and online survey results reveal:
* 80% indicate a high level of satisfaction with the website design and content.
* 90% strongly agreed the convenience of taking an online course was important to them.
* 85% stated that the website provides a necessary learning experience in addition to the recertification credit.
* Users were most knowledgeable in utilizing materials to neutralize spills (97% correct) and locking storage facilities (94% correct) before completing the web site.
* Users most improved their knowledge in pesticide storage and inventory regulations (a 30% increase in evaluative test scores) and signage regulations regarding language (a 22% increase in evaluative test scores) after viewing the web site.

* 2007 data from 10 months of web site activity due to server updates.

2. For general audiences in 2007 (WebTrends Analysis):

Visits: 5,087

Individual Visitors: 3,164

Visitors with >1 visit: 662

Top referring sites: 64% direct traffic,32.5% from Rutgers.edu

Hits: 26,297

Most Active Day: Thursday 10/11/07, 10 - 11 am, 1,653 Hits

Weekday Activity:Hits 20,862 (79 per day); Visits3,967 (14 per day)

Weekend Activity: Hits 5,435 (104 per day); Visits:1,240 (23 per day)

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems

Outcome #7

1. Outcome Measures

Short Term Increased knowledge and improved decision making skills of professionals and volunteers (Master Gardeners and Environmental Stewards) working in commercial horticulture professions (management and maintenance), commercial pest control operators, public health officials, municipalities and other governmental and non-governmental agencies. Increased number of trained youth and adult volunteers, and measurable impact of their assistance on clientele. Increased number of certified pest control operators. Increased number of youth and adult clientele utilizing Extension information and service to improve their own and others knowledge and decision making skills.

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:
Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Mercer County 4-H Junior Master Gardener Program

The positive outcomes of activity-based gardening programs for elementary school students have been identified by practitioners and researchers in the areas of nutrition; environmental awareness; multi-cultural education; and several areas of life skill development, including self-esteem, responsibility, and inter-personal skills. After-school time is used often to supplement and enrich academic courses, so highly engaging activities and project-based gardening curricula have the potential to increase students' science literacy and achievement. Recent studies report that elementary students who participate in gardening programs demonstrate significant gains in achievement and attitudes toward horticulture, science, and the environment.

What has been done

In 2007, 65 elementary school children from four (4) after-school programs throughout Mercer County earned Golden Ray certification in the Junior Master Gardener(r) program by increasing their understanding of horticulture, science, and environmental stewardship. Staff and volunteers from 4-H Youth Development teamed-up with two (2) school-sponsored after-school sites and two (2) Boys and Girls Club programs to enrich the after-school hours with science experiments, demonstrations, and projects focused on plants, soils, compost, insects, and ecology.

Mercer County 4-H uses the Level 1 JMG curriculum that includes a teacher/leader guide and youth handbook. Level 1 is packed with hundreds of activities for children in grades 3 to 5, and is divided into eight units: Plant Growth and Development, Soils and Water, Ecology and Environmental Horticulture, Insects and Diseases, Landscape Horticulture, Fruits and Nuts, Vegetables and Herbs, and Life Skills and Career Exploration.

Children in all four (4) after-school programs experienced a sampling of activities from across the curriculum, and earned the JMG Golden Ray certification in the Plant Growth and Development unit. Golden Ray certification is a recognition program for children who complete a Level 1 unit or a specialty curriculum from the Golden Ray Series (Health and Nutrition from the Garden, Literature in the Garden, or Wildlife Gardener).

The children earned their certifications by completing 12 activities from the unit, one life skill/career exploration activity, and a community service project. Youth at one (1) of the three (3) 2007 JMG after-school sites also completed enough activities to be certified in the Insects and Diseases unit. The children at three (3) of the four (4) sites completed flower plantings at school as their community service project. Two of the sites also prepared potted plants as give-a-ways for speakers of a related Extension program. All four programs concluded with an after-school recognition event including dinner, certificates, and multimedia shows of the children's experiences.

Results

Initial evaluation efforts demonstrated small improvements in students' attitudes toward science and subject matter knowledge. Students were asked to complete two (2) separate assessments during the first (pre-assessment) and final (post-assessment) weeks of the program. The Youth Attitudes Survey measured student attitudes in four separate dimensions: horticulture, general science, environmental stewardship, and interest in a science career. Each dimension included seven (7) statements for a total of 28 statements. Students were asked to read each sentence and circle the word ("Agree," "Disagree," "Not Sure") that best described their feelings about each sentence. The Youth Knowledge Survey measured existing knowledge about topics to be covered during the JMG program. Fifteen (15) questions were multiple choice and two (2) were matching. Comparisons between pre- and post-test scores show small improvements on both surveys.

Junior Master Gardener(r) Program
Survey Results
School A:
Horticulture (Max 14) Pre=10.20; Post=10.27
Science (Max=14): Pre-11.07; Post=11.40
Environmental Stewardship (Max=14):Pre-10.80; Post=11.47
Career Interest (Max=14): Pre-9.33;Post-10.33
Knowledge (Max=26): Pre-11.50; Post-14.14

School B:
Horticulture (Max=14): Pre=11.80; Post=12.67
Science (Max=14): Pre-12.40; Post=13.27
Environmental Stewardship (Max=14):Pre=11.60; Post=12.60
Career Interest (Max=14): Pre=11.73; Post=12.47
Knowledge (Max=26): Pre=11.85; Post=15.31

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems

Outcome #8

1. Outcome Measures

Short Term Increased knowledge and improved decision making skills of professionals and volunteers (Master Gardeners and Environmental Stewards) working in commercial horticulture professions (management and maintenance), commercial pest control operators, public health officials, municipalities and other governmental and non-governmental agencies. Increased number of trained youth and adult volunteers, and measurable impact of their assistance on clientele. Increased number of certified pest control operators. Increased number of youth and adult clientele utilizing Extension information and service to improve their own and others knowledge and decision making skills.

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Youth Engaged in Waste Management & Environmental Conservation.

Society is faced with issues related to the disposal and management of solid waste. It is vital to address these issues and concerns effectively and efficiently while maintaining a balance among the environment, human health and economic benefits. There are very few in-depth environmental and waste management programs for youth in 5th-7th grades. Today's young people, as the future leaders and inhabitants of our earth, must be empowered to take action to address these issues and create needed changes.

What has been done

The 4-H Environmental Ambassador Program is a 3 day/2 night educational opportunity for youth in grades 5-7 from a three county region in the southern part of New Jersey to study waste management and environmental conservation. Participants became environmental ambassadors in their schools and communities and are responsible for organizing and implementing environmental projects.

The program brings waste management alternatives and environmental issues to life through a variety of activities that utilize experiential, inquiry-based and cooperative learning techniques. Participants learn about alternatives such as recycling, landfilling, incineration, source reduction and composting. The program also emphasizes careers in the field of waste management and how everyone can have an impact on the environment by handling trash effectively.

Hands-on activities consisting of building a mini incinerator and landfill; constructing a compost bin; taking a trip through your trash; and habitat investigations are reinforced by tours. The youth explore a materials separation facility; landfill; composting facility; wastewater treatment plant and waste-to-energy plant. Participants apply the information they learned through role-play activities and an environmental town meeting.

College students develop workforce preparation skills and explore youth/adult partnerships by serving as group facilitators and ambassador project coaches/counselors. Serving in this capacity provides these students with an opportunity to explore their interests in working with youth and in conducting educational programs. They also develop and/or enhance their organizational and interpersonal communication skills as well as practice teaching techniques.

Results

Five hundred eighty-eight (588) youth and 142 adults (teachers, aides and parents) from 21 school districts have participated in the 4-H Environmental Ambassador Program. The program has proven to be very successful and has been enjoyed by the participants. Each year participants complete pre and post-test surveys, an end-of-program evaluation and an individual plan of action.
Evaluation data for 2007 revealed the following results:
*91% of the youth and adults increased their scores from the pre-test to post-test by an average of 47% in 2007.
*40 participants or 75% self-reported an increase in knowledge of waste management alternatives.
*24 participants or 45% self-reported an increase in knowledge of items that can be recycled.
*70% of the participants indicated on the end-of-program evaluation that they learned "A Lot" about waste management and environmental conservation while attending this program.
*95% of the participants indicated that they would recommend this program to other students in their school.
*85% of the participants rated the program as "Great" or "Good" on the end-of-program evaluation.

The majority of the participants indicate in their Plan of Action that they would share the information they learned with members of their family and students in their school. The most common responses to the evaluation question relating to the environmental things the participants plan to do because they attended this program were: improve recycling in home, school and community; to compost; to practice the 3 R's (reduce, reuse, recycle); to reduce littering; and to tell others about helping the environment.

There are several examples of how the students who attended the program have used or shared the information they learned. One school developed an educational video program about waste management and environmental conservation to be used on a local television station. Several schools conducted presentations for peers in their school, parents, school administrators, teachers and board of education members.

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought,weather extremes,etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programatic Challenges
- Populations changes (immigration,new cultural groupings,etc.)

Brief Explanation

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- Before-After (before and after program)
- During (during program)
- Time series (multiple points before and after program)
- Comparisons between program participants (individuals,group,organizations) and non-participants
- Comparisons between different groups of individuals or program participants experiencing different levels of program intensity.
- Comparison between locales where the program operates and sites without program intervention

Evaluation Results

Evaluation results are unique to each program. See Qualitative Outcome Statements.

Key Items of Evaluation

Program #8

V(A). Planned Program (Summary)

1. Name of the Planned Program

Integrated Pest Management

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
216	Integrated Pest Management Systems	100%		100%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2007	Extension		Research	
	1862	1890	1862	1890
Plan	23.0	0.0	13.0	0.0
Actual	5.0	0.0	7.6	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
126184	0	807312	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
452187	0	260362	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
128688	0	501242	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Research

•

Develop new and novel techniques for pest management and pest detection

Delivery

- Provide IPM information to a wide variety of stakeholders
- Employ new methods for delivery IPM information

Education

- Conduct IPM educational programs for stakeholders
- Conduct IPM educational training for university students
- Conduct IPM educational training for Vo-Ag and FFA students
- Conduct IPM public awareness campaign

•Work with communities, schools, businesses to help them meet their regulatory responsibilities on pesticide application
•Help growers develop scouting programs to identify pest populations before significant plant damage occurs.
•Develop pest management options to be used in an integrated or rotational program.
•Identify indicators to help growers anticipate pest problems.
•Develop monitoring techniques and population damage thresholds for selected pests.
•Provide scientifically sound advice to state regulatory bodies on pest management and pesticide issues
•Create a multidisciplinary program comprising of faculty, staff, volunteers, industry partners and government officials
•Investigate IPM methods to help growers produce top quality crops, limiting or reducing production costs.
•Evaluate all pest and crop management practices into a set of commercially used methods. These include the use of: pesticides, economic/aesthetic threshold levels, resistant cultivars, optimum horticultural practices, environmental monitoring, pest scouting, and fertility monitoring and recommendations.

2. Brief description of the target audience

•Municipalities
•Pesticide applicators and their employers
•Commercial pesticide applicators
•State Dept. of Environmental Protection
•Staff and students who gain valuable scientific experience
•Industry partners in agriculture and related commodities
•Consumers
•NJAES Faculty and Staff involved in pest management research/outreach
•Farmers

- Commodity groups
- New Jersey citizens
- School faculty, staff and children
- NJAES researchers
- Secondary and university students
- Governmental agencies
- Environmental organizations
- Agricultural, landscape, fine turf and other related industries

V(E). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
Plan	300	1000	10	100
2007	1500	2000	0	0

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year	Target
Plan:	0
2007 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan			
2007	2	8	10

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Field experiments, grower field days, newsletters and articles, peer reviewed publications, production guides, educational sym

Year	Target	Actual
2007	{No Data Entered}	0

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O No.	Outcome Name
1	Short Term · Develop improved IPM delivery methods · Develop detection, monitoring and sampling methods that reliably predict pest levels · Develop novel management methods for a wide variety of pests · Develop IPM training for secondary and university students · Improve public awareness about IPM · Determine the effectiveness of pheromones for mating disruption of pests · Greater understanding of entomopathogenic nematode species' effects on pests · Evaluation of the effectiveness of natural pesticides and crop management to reduce pests · Determine which types of plants attract pests to be used as a pest control method
2	Medium Term · Research and educational programs, and public awareness campaign increased adoption of IPM in traditional and non-traditional systems · Research findings used to develop new projects · IPM training of students creates new IPM interns, professionals and researchers · Knowledge of various natural insecticides and their effectiveness on pests · Determining the best time and application method for IPM products · Greater understanding of pest biology and ecology · Greater understanding of entomopathogenic species biology and ecology
3	Long Term · Protect commodities, homes and communities from pests · Increased abundance of high quality food and fiber products · Increased acreage in New Jersey grown under IPM practices · Reduced environmental problems associated with current pest management practices · A comprehensive understanding of best management practices for IPM that are economically viable and environmentally safe
4	Short Term * Develop improved IPM delivery methods * Develop detection, monitoring and sampling methods that reliably predict pest levels * Develop novel management methods for a wide variety of pests * Develop IPM training for secondary and university students * Improve public awareness about IPM * Determine the effectiveness of pheromones for mating disruption of pests * Greater understanding of entomopathogenic nematode species' effects on pests * Evaluation of the effectiveness of natural pesticides and crop management to reduce pests * Determine which types of plants attract pests to be used as a pest control method
5	Medium Term - Research and educational programs, and public awareness campaign increased adoption of IPM in traditional and non-traditional systems. Research findings used to develop new projects. IPM training of students creates new IPM interns, professionals and researchers. Knowledge of various natural insecticides and their effectiveness on pests. Determining the best time and application method for IPM products. Greater understanding of pest biology and ecology. Greater understanding of entomopathogenic species biology and ecology.
6	Medium Term - Research and educational programs, and public awareness campaign increased adoption of IPM in traditional and non-traditional systems. Research findings used to develop new projects. IPM training of students creates new IPM interns, professionals and researchers. Knowledge of various natural insecticides and their effectiveness on pests. Determing the best time and application method for IPM products. Greater understanding of pest biology and ecology. Greater understanding of entomopathogenic species biology and ecology.
7	Long Term * Protect commodities, homes and communities from pests * Increased abundance of high quality food and fiber products * Increased acreage in New Jersey grown under IPM practices * Reduced environmental problems associated with current pest management practices * A comprehensive understanding of best management practices for IPM that are economically viable and environmentally safe
8	Medium Term * Research and educational programs, and public awareness campaign increased adoption of IPM in traditional and non-traditional systems * Research findings used to develop new projects * IPM training of students creates new IPM interns, professionals and researchers * Knowledge of various natural insecticides and their effectiveness on pests * Determining the best time and application method for IPM products * Greater understanding of pest biology and ecology * Greater understanding of entomopathogenic species biology and ecology.

9	Medium Term - Research and educational programs, and public awareness campaign increased adoption of IPM in traditional and non-traditional systems * Research findings used to develop new projects * IPM training of students creates new IPM interns, professionals and researchers * Knowledge of various natural insecticides and their effectiveness on pests * Determining the best time and application method for IPM products * Greater understanding of pest biology and ecology * Greater understanding of entomopathogenic species biology and ecology.

Outcome #1

1. Outcome Measures

Short Term
· Develop improved IPM delivery methods
· Develop detection, monitoring and sampling methods that reliably predict pest levels
· Develop novel management methods for a wide variety of pests
· Develop IPM training for secondary and university students
· Improve public awareness about IPM
· Determine the effectiveness of pheromones for mating disruption of pests
· Greater understanding of entomopathogenic nematode species' effects on pests
· Evaluation of the effectiveness of natural pesticides and crop management to reduce pests
· Determine which types of plants attract pests to be used as a pest control method

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	700	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
216	Integrated Pest Management Systems

Outcome #2

1. Outcome Measures

Medium Term
· Research and educational programs, and public awareness campaign increased adoption of IPM in traditional and non-traditional systems
· Research findings used to develop new projects
· IPM training of students creates new IPM interns, professionals and researchers
· Knowledge of various natural insecticides and their effectiveness on pests
· Determining the best time and application method for IPM products
· Greater understanding of pest biology and ecology
· Greater understanding of entomopathogenic species biology and ecology

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:
Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	1000	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Development of Best Management Practices for Suppression of Anthracnose Disease on Annual Bluegrass Turf

Turfgrass is a valuable and rapidly expanding component of our urban and rural landscape. Turfgrass is used to stabilize soil and produce a playing surface on more than 16,000 golf courses. Golf courses are an important component of the turfgrass industry providing a source of green space in the urban environment and offering recreation and enjoyment for approximately 36 million Americans. Golf courses also generate jobs, commerce, economic development, and tax revenues for communities throughout the country. A recent report by the World Golf Foundation stated that golf contributes $62.2 billion worth of goods and services each year to the national economy (www.golf2020.com). In January 2001, a broad-based stakeholders group (part of a project funded by the NSF Center for IPM, included superintendents, university personnel, environmental and public health advocates, and representatives from the US Golf Association and the US EPA) prioritized key issues in IPM. Research and extension priorities cited by this group include (1) alternatives to current chemical pesticides, (2) forecast and sampling protocols for important pests of golf turf, and (3) a comprehensive Web-based treatment of golf turf IPM. Since 2001, anthracnose disease, caused by the fungus Colletotrichum cereale, has emerged as one of the most destructive diseases of annual bluegrass turf in North America. Before the initiation of this project, little was known about the distribution and control of this disease. Superintendents struggling to control anthracnose diseases often rely heavily on fungicides for disease suppression. However, relying solely on fungicides to control anthracnose is costly and has met with variable results, particularly when plants are under stress. Because of the increasing use of fungicides to control anthracnose, resistance to the benzimidazole and strobilurin fungicides has recently occurred on many golf courses in the U.S. It is likely that fungicide resistance will become more widespread if current chemical and cultural control practices are not altered. It is also probable that the increased frequency of anthracnose on putting greens is associated with the intensive management practices (e.g., low cutting heights, reduced nitrogen fertility, and the use of plant growth regulators) currently employed by superintendents to meet the ever-increasing expectations of the golfing public.

What has been done

Due to the severity of anthracnose on golf turf, studies were initiated at 9 universities, including Rutgers as part of a multistate (CA, CT, MD, MI, NC, NJ, NY, PA and ON [Guelph, Ontario Canada]) project (NE 1025). Goals of the project include (1) reducing the likelihood of anthracnose resistance to fungicide chemistries, (2) decreasing economic and environmental costs associated with the application of chemical pesticides used to control anthracnose, (3) increasing opportunities for the acceptance of new annual bluegrass varieties (should they be introduced into the marketplace), (4) increasing the likelihood that anthracnose-resistant grass varieties will be developed and marketed, (5) reducing the loss of revenue in the golf course industry due to widespread turf failure caused by anthracnose, and (6) providing an integrated chemical and biological anthracnose management system for intensely managed turf. The objectives of this project are to improve our understanding of the biology and ecology of anthracnose and to develop cultural, biological, chemical and genetic control options for the suppression of this pest on golf courses in the Northeast and Mid-Atlantic States. Research and outreach activities include sharing isolates and data pertaining to the genetics and pathogenicity of C. cereale. Management studies (cultural and chemical) have been initiated at Rutgers and other universities (PA, CA, NY, ON, CT). Breeding programs at PA and NJ have extensive collections of annual bluegrass and creeping bentgrass germplasm being used to determine the potential for genetic resistance to anthracnose. Golf course superintendents have been (2006-2007) and will be(2009) surveyed to document the impact of this research and outreach to disseminate the information. The PIs have extensive experience and successful track records in outreach and impact assessment.

The targeted audience of this work is a broad-based group of stakeholders interested in golf course IPM particularly those concerned about gaps in knowledge and management practices associated with anthracnose disease, one of the most important pest problems of annual bluegrass in the Northeast and Mid-Atlantic regions. A survey of 347 golf course superintendents from British Columbia Canada, California, Colorado, Connecticut, Washington D.C., Delaware, Illinois, Indiana, Iowa, Massachusetts, Maryland, Maine, Michigan, Minnesota, Missouri, Montana, New Jersey, North Dakota, Waiuku New Zealand, New Hampshire, New York, Ohio, Oklahoma, Ontario Canada, Pennsylvania, Rhode Island, Virginia, Vermont, Washington, Wisconsin, and West Virginia indicated that 72% had trouble with anthracnose. Of those who had troubles, 67% indicated they had moderate to severe levels of anthracnose. 41% of this group spent between $20,001 and $60,000 annually to manage anthracnose, while 8% indicated that annual costs to manage anthracnose was in excess of $60,000 per year.

Results

This project has helped improve the exchange of information among turfgrass management specialists and pathologists in the Northeast and Mid-Atlantic. To date, the results from this research have enhanced our understanding of the general biology and management of anthracnose disease on annual bluegrass. Adoption and implementation of this information by practitioners will result in improved management practices that are sustainable, cost-effective, and provide excellent control of anthracnose with reduced pesticide inputs. Initial survey information (year 2 of the 5 year project) indicated that 74% of golf course superintendents were somewhat aware or followed closely the anthracnose research being conducted in this project. 85% of those who were aware of our anthracnose research said that the information obtained was helpful or changed their management practices. And 52% and 46% said these changes in management practices were somewhat or very helpful in reducing the severity of anthracnose on their golf course, respectively. Another survey of turfgrass managers throughout the Northeast and Mid-Atlantic regions will be conducted in year 4 (2009) of this project to identify additional and more detailed impacts.

4. Associated Knowledge Areas

KA Code	Knowledge Area
216	Integrated Pest Management Systems

Outcome #3

1. Outcome Measures

Long Term

· Protect commodities, homes and communities from pests

· Increased abundance of high quality food and fiber products

· Increased acreage in New Jersey grown under IPM practices

· Reduced environmental problems associated with current pest management practices

· A comprehensive understanding of best management practices for IPM that are economically viable and environmentally safe

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	1500	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Tree Fruit Integrated Pest Management (IPM) Delivery

New Jersey tree fruit production is located in both southern and northern counties. Statewide in 2007, tree fruit was valued at $14 million for apples and $36 million for peaches. The industry in southern counties is heavily oriented towards wholesale markets and peach production, while the industry in northern counties is heavily dependent on direct markets and apple production. Retail market fruit production in northern counties is valued at approx. $10-15 million.

New Jersey fruit growers produce commodities that are susceptible to more than two dozen arthropod and disease pests. Management of this pest complex can cost producers up to $500 or more per acre. Some large NJ growers may spend up to $350,000 for pesticides alone. Fertilizers also represent a major cost impact. Growers can experience depressed prices from foreign and west coast competition, often leading to deficits in the farming operation. Production costs are high due to labor, fertilizer and energy costs, and pesticide costs. Pest management costs have increased due to label restrictions on old products and the introduction of newer more expensive pesticides. The Food Quality Protection Act has led to restrictions and changes in the types of pesticides that may be used to produce many fruits. Many of the new pesticides are narrow spectrum, that control only one or a few pests and must be used with degree day phenology models and other integrated pest management (IPM) practices. While customers continue to demand high quality clean fruit, they are also aware of pesticide use, and want an assurance of safe food with little to no pesticide residues. An IPM delivery program has been delivered to commercial growers, statewide.

What has been done

An integrated crop management (ICM) program was delivered to commercial fruit growers who produced apples, peaches, and nectarines. The program reached both primary and secondary participants. Secondary participants attend extension update meetings, and receive other IPM/ICM information through personal visits, fax broadcasts, articles, newsletters and the Internet. Primary participants are those growers who access all the above information and participate in a field scouting program. While some primary participants do self-scouting, the majority contribute funding through acreage participation fees which fund seasonal field scouts, travel, supplies, and laboratory costs. Weekly field scouting forms the program core and data source for newsletter articles, and from which pest management recommendations were made, with nutrition and nematode management included at specific times of the season. A broadcast fax service was used in Hunterdon and Gloucester Counties to advise of timely pest events and supplement the Plant and Pest Advisory Fruit Edition Newsletter. Grower meetings reached a total of 265 farmers. 22 weekly articles were written in a statewide newsletter, with a total circulation of 212 subscribers in NJ and 9 other states. Acreage impacted by primary participants totaled 70% of all state tree fruit acreage.

Objectives of the program:

* Maintain or increase crop quality and yield, and marketing ability through modern integrated pest management practices.
* Develop new and novel techniques for pest management and pest detection, and employ new methods for tree fruit IPM delivery.
* Provide IPM information to tree fruit growers primarily in Gloucester, Salem, Cumberland, Camden, Atlantic, Hunterdon, Warren, Morris, Bergen, Sussex, Mercer, and Middlesex Counties. Program information also available statewide to all growers through meetings, demonstration trials, newsletters, and other training methods.
* Reduce the use of OP, carbamate and other toxic pesticides in favor or reduced risk technologies and alternate management strategies.
* Minimize non-point source pollution through the reduction of fertilizer and pesticide sources, and enhance water quality through similar means.
* Reduce farm worker exposure to pesticides.
* Reduce or minimize production costs.

Growers and industry personnel were trained throughout the season and at several annual winter meetings. Primary participants included 24 growers in northern counties and 17 growers in southern counties. Growers return every year to the program, even though they pay participation fee for program support. During 2007 primary participants in northern counties contributed just over $15,000 for programming on 414 acres. Growers in southern counties supported the program with $35,000 on farms, which managed just over 3,500 acres of tree fruit.

Results

The program demonstrated reduced risk methods that included the use of mating disruption and ground cover management as tools to replace insecticide use for Oriental fruit moth, tarnished plant bug and stink bugs and two species of peach tree borers. Degree-day pest phenology models were updated, and proper use was advised to growers. An IPM database was updated to record pests and pesticide use data. Pesticide use records were collected at the end of the season to measure the program impact on pesticide use. A demonstration research trial was conducted at the Rutgers Snyder Research and Extension Farm to demonstrate the effectiveness of mating disruption for oriental fruit moth (OFM) on both apples and peaches. Ten commercial growers also used this practice, partially encouraged by this demonstration program. The practice resulted in the control of OFM while eliminating 5-7 insecticide sprays after first cover on both apple and peach, with no loss to fruit quality. This is equal to an average savings of 12lb/acre of formulated insecticide, or $90/acre in pesticide costs, although offset by mating disruption costs.
On average, program participants reduced pesticide use by 26-80% compared to standard spray schedules, depending on the practices used. The program demonstrated reduced risk methods that included the use of mating disruption and ground cover management as tools to replace insecticide use for oriental fruit moth, tarnished plant bug and stink bugs and two species of peach tree borers. Grower use of degree day based pest models reduced insecticide use by 40% compared to standard calendar spray methods. Weekly pest management recommendations to growers led to pest free fruit valued at $50 million throughout the state.

Laboratory tests where completed in 2007 as part of the fertility component. Over 75% of areas sampled were shown have sufficient to excessive phosphorous levels, which led to decreased phosphorous use on those sites.

4. Associated Knowledge Areas

KA Code	Knowledge Area

216	Integrated Pest Management Systems

Outcome #4

1. Outcome Measures

Short Term * Develop improved IPM delivery methods * Develop detection, monitoring and sampling methods that reliably predict pest levels * Develop novel management methods for a wide variety of pests * Develop IPM training for secondary and university students * Improve public awareness about IPM * Determine the effectiveness of pheromones for mating disruption of pests * Greater understanding of entomopathogenic nematode species' effects on pests * Evaluation of the effectiveness of natural pesticides and crop management to reduce pests * Determine which types of plants attract pests to be used as a pest control method

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Crop Management Program

Insect damage to crops can cost farmers significant money every year. Weather related damage due to excessive moisture or drought also has potentially damaging effects. In order to minimize damage to crops from insects it is important to actively scout crops for insects, nutrient deficiencies, and weather damage and alert the producer in a timely manner so that the appropriate actions can be taken based upon recommendations made from Extension experts.

What has been done

There were a total of 1,285 acres and 5 growers involved in the crop management program during 2007. Timely herbicide application recommendations were used to help farmers to control weed populations in their crops. Soil testing was also a valuable tool used to help growers reduce the phosphorous applications to their fields. Scouting for all variables occurred from 1 to 2 times a week, especially where large populations of damaging insects were discovered.

Results

Implementation of recommended management practices to control insect and weed damage and application of nutrients to the soil helped the grower to save money and time; as well as benefit the environment. Crop moisture monitoring also assisted producers by alerting them to the best time to harvest; thereby increasing feed quality and quantity. Because of the program growers were able to have their crops scouted for insects while they were able to take care of their other farm responsibilities.

4. Associated Knowledge Areas

KA Code	Knowledge Area
216	Integrated Pest Management Systems

Outcome #5

1. Outcome Measures

Medium Term - Research and educational programs, and public awareness campaign increased adoption of IPM in traditional and non-traditional systems. Research findings used to develop new projects. IPM training of students creates new IPM interns, professionals and researchers. Knowledge of various natural insecticides and their effectiveness on pests. Determining the best time and application method for IPM products. Greater understanding of pest biology and ecology. Greater understanding of entomopathogenic species biology and ecology.

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

I.P.M. for Landscape Contractors

Bergen County Landscape Contractors have traditionally applied excessive quantities of chemical pesticides and fertilizers in the maintenance of lawns and landscapes. Each landscape contractor can represent 25-75 residential properties and/or commercial properties. Each contractor can represent 12-50 acres of landscapes in Bergen County. This points to many tons of chemicals often applied unnecessarily or at the wrong time (i.e.: when target pests are not present). As a result air quality and water quality may be compromised. Also, there are clear threats to human health, household pets and beneficial organisms (e.g.: pollinating bees, predatory insects).

What has been done

North Jersey Ornamental Horticulture Symposium; 47th year of program for training professionals in turf, tree and landscape professions; auditorium-style lectures with questions and answers; specialists, agents and other experts present and timely updates on pests, cultural practices, new varieties and research trials.

Results

129 evaluations were completed by attendees at the North Jersey Ornamental Symposium. Of these attendees 94 had attended NJOHS Landscape Day in the past.
128 responded that they learned new things that they will apply to their landscape management practice. They included IPM tactics, identifying pests and pesticide regulations.
118 expressed that they believe they will make more informed pest management decisions as a result of the Landscape Day training.
36 reported that as a result of previous NJOHS Landscape Day training their businesses saved money.
53 reported using less pesticides as a result of the training:
Of these:
34 reported 10-20% reduction in pesticide use
20 reported 30-50% or greater reduction
Additional Impacts:
Most attendees (89) report the NJOHS has helped them to:
- maintain NJ DEP pesticide license
- increase sales
- train their employees
- offer IPM services
- improve communication with clients

4. Associated Knowledge Areas

KA Code	Knowledge Area
216	Integrated Pest Management Systems

Outcome #6

1. Outcome Measures

Medium Term - Research and educational programs, and public awareness campaign increased adoption of IPM in traditional and non-traditional systems. Research findings used to develop new projects. IPM training of students creates new IPM interns, professionals and researchers. Knowledge of various natural insecticides and their effectiveness on pests. Determing the best time and application method for IPM products. Greater understanding of pest biology and ecology. Greater understanding of entomopathogenic species biology and ecology.

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The North Jersey Ornamental Horticulture Turf Day Program

According to a 2001 Rutgers University study of the turf industry in New Jersey, 890,425 acres of NJ (19% of the state's total acreage) is planted in turfgrass. Professional turf managers care for 39% of this acreage. One segment of the industry is the 2,442 service providers who maintain commercial and residential properties. These private businesses employed 5,741 people at the time of the study providing $400 million in payroll and benefits. They also contributed $691 million in cash expenditures to NJ's economy. The turf service industry reported $1.3 billion dollars in revenues.

What has been done

The North Jersey Ornamental Horticulture Turf Day program focuses on turf management issues for landscape turf service providers. The main objective of the program is to encourage the adoption of integrated pest management practices by the turf management industry, ultimately reducing the amount of fertilizers and pesticides used on residential and commercial properties.

The one day program features five lectures by Extension, Industry and Regulatory professionals. Participants receive handouts prepared by the lecturers. Program topics are selected based upon current issues such as new pesticide or fertilizer use regulations, weather conditions such as drought, or the emergence of new insect or disease problems. Participants suggest program topics on evaluations.

Results

Average annual attendance is 250 people. Most attendees are private turf management business professionals.

In 2007, professionals who attended the program in previous years were asked how the information presented at prior programs affected their business or career. Respondents (n=122) indicated:
88% have been able to maintain their NJ Department of Environmental Protection Pesticide Applicator License.
80% practice IPM.
67% see improved communication with their customers.
66% use the information to train employees.
42% experienced an increase in sales.
25% indicated their attendance helped them get a promotion.

Conference participants (194) completed a program evaluation. Ninety-eight percent (98%) indicated that they would apply what they learned at the conference to their turf management practices, and 149 professionals said they will make more informed pest management decisions as a result of the program.

One hundred twenty-two (122) professionals had attended the program in the past and 95% have changed pest control practices as a result of the training. One hundred twelve (112) professionals use 10% to 30% less chemicals.

When asked if the conference has helped their business save money, 49 professionals indicated yes. Average savings were 11% with a range of 1 to 25%. One company reported a 50% reduction in chemical costs and another company experienced $7,000 in savings.

4. Associated Knowledge Areas

KA Code	Knowledge Area
216	Integrated Pest Management Systems

Outcome #7

1. Outcome Measures

Long Term * Protect commodities, homes and communities from pests * Increased abundance of high quality food and fiber products * Increased acreage in New Jersey grown under IPM practices * Reduced environmental problems associated with current pest management practices * A comprehensive understanding of best management practices for IPM that are economically viable and environmentally safe

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Blueberry Integrated Pest Management Delivery

Blueberries are a unique agricultural commodity, since they are one of only several native foods in commercial production in the US. In New Jersey most blueberries are grown in the ecologically sensitive 'New Jersey Pinelands', which is characterized by porous soils with high water tables, which are subject to vertical movement of a number of agricultural chemicals. This area is a source for much of the surface and shallow ground water found in the southern and central part of the State, and encompasses the Cape May, Rancocas, Great Egg Harbor, Mullica, and the Barnegat Bay watersheds, home to over 2.6 million people. The pest complex on blueberries is extensive, with pests attacking virtually all parts of the plant (e.g., fruit, buds, leaves, roots, stems, flowers) and pest management requiring up to 12 pesticide sprays per year. The vast majority of these sprays are high risk organophosphate and carbamate materials, which are likely to adversely affect the myriad number of farm workers present during harvest. At present the blueberry industry is seeing a per capita increase in consumption of fruit, often by children, which may in part be from the many health benefits derived from the antioxidants contained in the berries. Blueberries have developed into an international sensation, with many countries starting or increasing production. These facts mandate the implementation of pest management strategies that deliver high quality fruit with minimal insecticide residues.
Organophosphates and carbamates have been the cornerstone of insect pest management programs in blueberries for the past 40 years. Insecticide-use data collected by University IPM programs in NJ, MI, and ME indicated that ca. 90% of insecticide applications in these states are with broad-spectrum organophosphate and carbamate insecticides. In 2003, blueberry growers used 3.62 lb a.i. per acre of various insecticide products. With 7,500 acres of blueberries in NJ, this translates to about 27,150 lb a.i. statewide. Most of the a.i. was from organophosphates and carbamates (98.3% or 26,688 lb), with only 1.7% of all insecticide materials classified as reduced-risk.
Over 40 different insect and disease pests can attack highbush blueberries. Pest management costs continue to increase. The Food Quality Protection Act has led to restrictions and changes in the types of pesticides that may be used to produce blueberries. Many of the new pesticides are narrow spectrum, that control only one or a few pests and must be used with degree day phenology models and other integrated pest management (IPM) practices. As labels for older products are restricted, and newer more expensive products come on the market, production costs have increased. Some blueberry growers can spend up to $250,000 per year in pesticide materials.

What has been done

An integrated pest management (IPM) program was delivered to commercial blueberry growers. The program employed seasonal field scouts who collected weekly pest management data. The program reached all blueberry growers in New Jersey, but collected farm specific data on those farms participating in the scouting program. Results of scouting data were summarized in 2 statewide newsletters (The Blueberry Bulletin and The Plant & Pest Advisory-Fruit Edition). Results were also transferred to growers with farm visits, seasonal update meetings, and a broadcast fax system. The program collected data on insect and disease pests as well as fertility levels through soil and plant tissue sampling. Based on the scouting results, pesticide recommendations were made to all growers, within the objectives listed above.

A research/demonstration component demonstrated and refined the use of alternative pest management practices such as the use of trapping methods for determining treatment timings for blueberry maggot, and mating disruption for Oriental beetle. A GIS based management program was started that demonstrated the effectiveness of farmwide spatial management for blueberry maggot.

Objectives of the program:

* Maintain or increase crop quality and yield, and marketing ability through modern integrated pest management practices.
* Develop new and novel techniques for pest management and pest detection, and employ new methods for blueberry IPM delivery.
* Provide IPM information to blueberry growers primarily in Atlantic and Burlington counties, but also statewide through demonstration trials, scouting, meetings and other training methods.
* Reduce the use of OP, carbamate and other toxic pesticides in favor or reduced risk technologies and alternate management strategies.
* Minimize non-point source pollution through the reduction of fertilizer and pesticides sources, and enhance water quality through similar means.
* Reduce farm worker exposure to pesticides.
* Reduce or minimize production costs.

* Growers participated in an IPM program, and maintained high fruit quality while minimizing pesticide use. In 2007, this included 38 growers who grew 4400 acres of blueberries or about 60% of the state acreage, and about 70% of the state production.

Results

* Growers cooperated with the program in the use of new detection, monitoring and sampling methods that reliably predict pest levels.
* Growers were educated about novel management methods for a variety of pests in blueberries.
* Through demonstrations, articles, county reports and other outreach, public awareness on IPM was improved. Articles appeared in 2 newsletters with 45 editions and 379 subscribers. Newsletters were also Web -Based and recorded 6,397 downloads.
* New pest management programs were utilized using new reduced risk materials and practices. Growers managed pests with the use of intensive monitoring, GIS based data collection and pesticide use record keeping, and trapping methods for key pests like blueberry maggot. Growers managing blueberry maggot under IPM methods reduced insecticide use on average from 6 applications to 1-2 applications, or over 66%.
* Pesticide use for OP and carbamate pesticides was reduced. Overall pesticide use was minimized. After 4 years of working with reduced risk alternatives in a USDA RAMP program, the following results were seen: Blueberries managed under the RAMP program had between 45% and 58% lower amounts of insecticide active ingredient applied than those grown using grower's standard programs, with even greater reductions in the total amount of insecticide residue detected on leaves and fruit at harvest. Overall, growers who practiced IPM at high levels, used from 6-8 lb ai of pesticide per acre, while growers treating on a pure calendar schedule, used up to 34 lb ai per acre.
* Growers minimized on farm pest management costs. Some growers spent as much as $235/A for pesticides while the average IPM participant spent $132/A. The average grower using IPM practices saved about $100/A.
* New pest management practices such as mating disruption and whole farm GIS based monitoring were used. Small plot research/demonstration trials for Oriental beetle mating disruption showed that Oriental beetle could be managed with mating disruption in place of soil applied insecticide.
* IPM training of students and farm employees created new IPM interns, professionals and researchers. The program trained 5 students and seasonal workers, and 1 farm employee as IPM scouts, enabling the 60% of NJ blueberry acreage to be under IPM practices, and 16% of NJ acreage to be self scouted.
* Fertility monitoring leads to recommendations of lower fertilizer use. During 2007, over 500 samples were taken for combined monitoring of plant fertility and nematode levels. Soil and plant fertility tests demonstrated that about 75% of fields sampled had sufficient to high levels of soil phosphorous.

4. Associated Knowledge Areas

KA Code	Knowledge Area
216	Integrated Pest Management Systems

Outcome #8

1. Outcome Measures

Medium Term * Research and educational programs, and public awareness campaign increased adoption of IPM in traditional and non-traditional systems * Research findings used to develop new projects * IPM training of students creates new IPM interns, professionals and researchers * Knowledge of various natural insecticides and their effectiveness on pests * Determining the best time and application method for IPM products * Greater understanding of pest biology and ecology * Greater understanding of entomopathogenic species biology and ecology.

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Vegetable Integrated Pest Management Training

Today's vegetable industry is rapidly changing due to increased technology and world markets. Rutgers Cooperative Extension and Research Vegetable Working Group Team is the main conduit for information directly to vegetable producers in the state of New Jersey. This industry needs a science-based, non-biased source of information they can trust and rely on to remain successful for years to come.

What has been done

Vegetable Integrated Pest Management educational programs have been conducted on a regular basis during the production season to keep producers informed on current issues and practices. To date 5,200 vegetable producers, industry respresentatives and agency personnel were educated through these programs.

Results

Through these educational events farmers and others are provided information on regulatory mandates, pest control, fertility practices, marketing strategies, crop insurance, varietal recommendations and many other agricultural issues. This information assists the producers in keeping in compliance with regulations preventing fines and citations when farm inspections are done. In 2007 only 1 farm in Southern New Jersey was found to be in violation of NJDEP Pesticide Control Program regulations upon inspection. Additionally, based on extension educational programs, producers are choosing the best plant materials, improved pest control options, responsible fertility practices and making other sound farm management decisions to remain competitive in today's world market.

4. Associated Knowledge Areas

KA Code	Knowledge Area
216	Integrated Pest Management Systems

Outcome #9

1. Outcome Measures

Medium Term - Research and educational programs, and public awareness campaign increased adoption of IPM in traditional and non-traditional systems * Research findings used to develop new projects * IPM training of students creates new IPM interns, professionals and researchers * Knowledge of various natural insecticides and their effectiveness on pests * Determining the best time and application method for IPM products * Greater understanding of pest biology and ecology * Greater understanding of entomopathogenic species biology and ecology.

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Management of Oriental Fruit Moth and Other Peach Arthropod Pests

There is a lack of new OFM insecticides in the testing pipeline that prevents insecticide rotation for resistance management purposes. Likewise, we need to determine the efficacy of OFM tools on other arthropods inhabiting peach orchards.

What has been done

A multi-faceted study is being conducted to better understand the biology of the Oriental fruit moth (OFM) leading to the development of new management techniques that incorporates better timing of new soft insecticides with mating disruption. The impact of these new pesticides on other peach anthropod pests will be documented. The OFM egg-hatch spray-timing model is being used in grower orchards allowing growers to accurately time sprays against OFM. Product costs are considerably higher for OFM mating disruption products than for OP insecticides making the incorporation of these products into peach IPM programs less likely.

The objectives are to determine the efficacy and optimal time to treat peach with various chemical classes of insecticides to control OFM; evaluate efficacy of new insecticides against key peach antrhopod pests; and evaluate the efficacy of OFM mating disruption for OFM control and the effect of this technology on insecticide use.

Replicated field experiments were conducted and evaluated to assess new and currently registered insecticides agains the oriental fruit moth and other key arthropod pests that attach peach and nectarine. Results were presented at grower field days and as updates in the newsletter articles and the annually revised production guide.

Results

We are finding that several op-replacement and reduced-risk insecticides are effective against many of the key arthropod pests that attach peach and nectarine. The area where no suitable replacement is for stink bug management as the best products are pyrethroids. These tend to disrupt IPM programs when used. Growers are adopting some of these new materials because of their efficacy or because the loss of organophosphate insecticides.

4. Associated Knowledge Areas

KA Code	Knowledge Area
216	Integrated Pest Management Systems

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought,weather extremes,etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programatic Challenges
- Populations changes (immigration,new cultural groupings,etc.)

Brief Explanation

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- Before-After (before and after program)
- During (during program)
- Time series (multiple points before and after program)
- Comparisons between program participants (individuals,group,organizations) and non-participants
- Comparisons between different groups of individuals or program participants experiencing different levels of program intensity.
- Comparison between locales where the program operates and sites without program intervention

Evaluation Results

Evaluation results are unique to each program. See Qualitative Outcome Statements.

Key Items of Evaluation

Program #9

V(A). Planned Program (Summary)

1. Name of the Planned Program

Aquaculture

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
135	Aquatic and Terrestrial Wildlife	40%		40%	
308	Improved Animal Products (Before Harvest)	60%		60%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2007	Extension		Research	
	1862	1890	1862	1890
Plan	1.3	0.0	4.8	0.0
Actual	2.0	0.0	4.3	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
38332	0	101925	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
90437	0	401382	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
25737	0	3914	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

•Investigate the genetic mechanisms for disease resistance and improved quality in economically important shellfish

•Create a dynamic and cooperative partnership with faculty, staff, businesses, regulatory/advisory councils and the government to research best management practices and discover effective solutions and management practices to address threats to NJ aquaculture as well as investigate opportunities to increase the quality and quantity of the aquaculture harvest.

•Collect and analyze data on how communities and businesses are affected by the aquaculture industry management practices

•Examine the presence of unhealthy levels of contaminants in aquaculture products

•Determine best techniques for shellfish hatcheries on- and off-shore

2. Brief description of the target audience

•Aquaculture-related businesses and employees
•State Dept. of Environmental Protection
•State Dept. of Agriculture
•Industry partners who learn ways to improve or protect their harvests
•Communities who depend on aquaculture-related revenue
•NJAES Faculty and Staff involved in water research/outreach
•Consumers of aquaculture products, including recreational fishing

V(E). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
Plan	100	300	30	300
2007	370	675	60	0

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year	Target
Plan:	1
2007 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan			
2007	0	11	11

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Field sampling, laboratory analysis. 13 non refereed articles, 8 extension specialists, 17 professional presentations, 10 radio p

Year	Target	Actual
2007	{No Data Entered}	0

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O No.	Outcome Name
1	Short term Knowledge of seasonal variations for shellfish diseases Create census data on communities involved in aquaculture Determine the level of pollutants in economically important fish species Develop markers and maps of important genetic traits Knowledge of shellfish hatchery techniques that decrease time for growth to market size
2	Medium term Identify spatial and temporal relationships between patterns of shellfish diseases in NJ and environmental correlates To develop disease-resistant strains of shellfish Develop superior disease-resistant and larger genetic lines of shellfish Measure the impact of communities on the aquaculture industry Knowledge of the feasibility of off-shore shellfish farming
3	Long term Clear and comprehensive understanding of community, environmental, genetic and physical regulators of aquaculture quality and quantity A safe and secure aquaculture industry that can meet consumer demands for high-quality products and also be environment friendly and economically viable Creation of superior aquaculture products that will be of high demand outside NJ
4	- Knowledge of seasonal variations for shellfish diseases - Create census data on communitites involved in aquaculture - Determine the level of pollutants in economically important fish species - Develop markers and maps of important genetic traits - Knowledge of shellfish hatchery techniques that decrease time for growth to market size.
5	Short term Knowledge of seasonal variations for shellfish diseases Create census data on communities involved in aquaculture Determine the level of pollutants in economically important fish species Develop markers and maps of important genetic traits Knowledge of shellfish hatchery techniques that decrease time for growth to market size

Outcome #1

1. Outcome Measures

Short term

Knowledge of seasonal variations for shellfish diseases
Create census data on communities involved in aquaculture
Determine the level of pollutants in economically important fish species
Develop markers and maps of important genetic traits
Knowledge of shellfish hatchery techniques that decrease time for growth to market size

2. Associated Institution Types

•1862 Extension
•1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	150	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Rebuilding Oyster Beds and the Industry in New Jersey

Disease and environmental problems have decimated the oyster industry in the mid-Atlantic. Though disease-resistent oysters are available, rebuilding the oyster beds is still a challenge, and environmental and climate concerns still plague the oyster industry. In New Jersey, 13,000 acres of natural oyster beds are being maintained, to aid in re-establishing the population of oysters in the area. Disease is still the greatest concern for the industry, and genetic improvement of aquaculture species like oysters limited by a lack of understanding of their genomes. The two main diseases, MSX and Dermo, kill over 50-90% of affected oysters, though disease-resistance is found in some genetically resistant oysters.

What has been done

Several faculty have been working on identifying potential intervention or control points that can improve management and regulation of the shellfish industry, specifically disease management and oyster bed reseeding. Also, faculty have been working on creating genetic maps for eastern oysters, to compare to other species and to better understand the biological mechanisms underlying economically important traits, such as disease-resistance.

Results

The first effort involved collecting newly recruited oysters from a high recruitment high mortality zone in the lower Bay and planting them on a low recruitment high survival zone. These oysters survived well and provided an estimated enhancement of nearly 8 million marketable oysters. Results have led to additional enhancement efforts, including direct shell planting. The Delaware Bay Shellfish Council continues to rely on monthly updated of oyster disease and mortality in Delaware Bay New Jersey for their management efforts. Technical reports presented for the Annual Delaware Bay New Jersey Oyster Seedbed Stock Assessment Workshop (SAW) provide new insights leading to better management strategies and are used in setting harvest allocations for upcoming year. For the genome, over 200 co-dominant markers were identified that coincide with disease resistance genes. The identification and mapping of disease-resistance genes with co-dominant markers is a significant development, so that disease-resistance genes can be easily identified and selected, to improve the breeding program. This will enhance the overall health of the oyster species, and the profitability of the industy.

4. Associated Knowledge Areas

KA Code	Knowledge Area

308	Improved Animal Products (Before Harvest)

Outcome #2

1. Outcome Measures

Medium term

Identify spatial and temporal relationships between patterns of shellfish diseases in NJ and environmental correlates

To develop disease-resistant strains of shellfish

Develop superior disease-resistant and larger genetic lines of shellfish

Measure the impact of communities on the aquaculture industry

Knowledge of the feasibility of off-shore shellfish farming

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	200	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
135	Aquatic and Terrestrial Wildlife
308	Improved Animal Products (Before Harvest)

Outcome #3

1. Outcome Measures

Long term

Clear and comprehensive understanding of community, environmental, genetic and physical regulators of aquaculture quality and quantity

A safe and secure aquaculture industry that can meet consumer demands for high-quality products and also be environment friendly and economically viable

Creation of superior aquaculture products that will be of high demand outside NJ

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:
Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	250	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
308	Improved Animal Products (Before Harvest)
135	Aquatic and Terrestrial Wildlife

Outcome #4

1. Outcome Measures

- Knowledge of seasonal variations for shellfish diseases
- Create census data on communitites involved in aquaculture
- Determine the level of pollutants in economically important fish species
- Develop markers and maps of important genetic traits
- Knowledge of shellfish hatchery techniques that decrease time for growth to market size.

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:
Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Jersey Summer Shore Saftey: Optical Brightener Monitoring Framework

Coastal recreation and tourism is a multi-million dollar industry at the Jersey Shore. Increased development and continual impact to surface waters threatens the health, quality of life, and economic livelihood of this region. Bacterial pathogen pollution, in particular, often leads to beach closings and reduced recreational opportunities, economic impact on the shellfish industry, and presents a health concern for both residents and visiting tourists. Although agencies conduct regular monitoring, the isolation of human bacterial pathogens remains a problem for both analysis and remediation of this pollution type. Complicating this is the continual restriction of monitoring budgets, which limits the scope of routine government monitoring.

Several new detection methods for identifying specific bacteria are being investigated such as MAR and qPCR, which are complex, quick, accurate and relatively expensive. Optical brighteners (OBs) are fluorescent white dyes that are added to laundry detergents and soaps to enhance the brightness of white cotton fabrics. These brighteners are usually found in domestic wastewater that contains laundry effluent, and fluoresce under UV light. The observation of Optical Brighteners in surface waters can, therefore, indicate improperly treated human effluent. OBs have been identified as an inexpensive, simple method of human-specific microbial source tracking with the potential for success. This would make them an ideal screening method to be used by the volunteer monitoring community as well as youth and community groups.

What has been done

Field sampling and laboratory analysis of various optical brightener methods has been performed to establish a standard protocol for this type of sampling in coastal New Jersey Waters. Contacts have been made with other New Jersey groups performing this type of sampling to create a unified statewide framework.

This program aims to train volunteer monitors and students to use optical brightener monitoring as a screening tool to identify bacterial pathogen hot spots due to human sources. The results of the monitoring can then be disseminated to public groups concerned about bacterial water quality, such as recreation groups, the general public, and commercial and recreational shell fishers. In addition, hot spot information can be distributed to regulatory and government agencies for follow up.

Results

Although the program is in it's initial stages, a partnership has been forged with the New Jersey Department of Environmental Protection Volunteer Monitoring Program to create a statewide framework for the use of optical brighteners as a screening tool for human pathogen monitoring in surface waters.

Thus far, the program has had a more individual impact involving the interns that have assisted with the water quality aspects of the program. Out of eight interns, four (50%) responded to an anonymous web survey evaluating their experience.

All students indicated improved knowledge of local coastal water issues, water quality monitoring, non point source pollution, microbial source tracking, and optical brighteners. All students agreed that they learned about water related topics, planned to use the knowledge they learned in their future careers, felt the internship was valuable to their future career, and learned more about Cooperative Extension.

Seventy-five percent of the students stated that they acquired important skills using Geographic Information Systems, and improved skills relating to field sampling, laboratory analysis techniques, project management, and development of educational materials. Seventy five percent of the students also said they were surer they wished to pursue a career in the field after their internship experience, with one student neither agreeing or disagreeing.

4. Associated Knowledge Areas

KA Code	Knowledge Area
135	Aquatic and Terrestrial Wildlife

Outcome #5

1. Outcome Measures

Short term Knowledge of seasonal variations for shellfish diseases Create census data on communities involved in aquaculture Determine the level of pollutants in economically important fish species Develop markers and maps of important genetic traits Knowledge of shellfish hatchery techniques that decrease time for growth to market size

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Barnegat Bay Shellfish Restoration Program

Since 1985 there has been a loss of about 900 full and part-time commercial clammers in NJ. The majority of clamming used to be concentrated in the Barnegat and Little Egg Harbor Bays. NJDEP Bureau of Shellfisheries reports significant reductions of hard clam, Mercenaria mercenaria, stocks in those same areas. Coastal development, increased boat activity, use of CCA treated lumber, harvest pressure, and use of bay water for nuclear reactor cooling have all been suggested as reasons why hard clam stocks are depleted. Many years ago, Barnegat Bay also supported several working oyster reefs. Because of many of the same reasons listed, those shellfish beds have long since been lost.

Shellfish harvesting was one of the main industries on which the early economy of Ocean County was built. Along with the loss of the shellfish, but not quite as obvious was the loss of habitat and nutrient reduction that can be attributed to both hard clams and oysters. A restoration of shellfish beds in Barnegat and Little Egg Harbor Bays may offer both an environmental benefit as well as an educational benefit of teaching the citizens of the watershed more about the ecology of the Bays and the peoples' place in protecting and restoring some of the natural resources that support a healthy environment for the estuary.

What has been done

The Shellfish Restoration Project serves to educate the citizens of Ocean County and NJ about the coastal bay, its watersheds and peoples' impact on these natural resources by using the hard clam and oyster as living representatives of the bay ecosystem. We educate people about the requirements needed by these shellfish that serve as watchdogs for good water quality, and how they can be stewards of the natural resources that we share.

The physical part of the process includes setting up land based and in-water shellfish nurseries. Once the shellfish have grown, they will be placed in the bay either in beds covered with predator control screen or on oyster reefs. When the clam seed has a better chance of survival without predator control, the small clams will be broadcast planted in public areas for eventual harvest. The oysters will have similar treatment.

We train through a classroom setting, a group of volunteers who participate in the process. Classes are led by the PIs, other extension personnel, and individuals from NJDEP Bureau of Shellfisheries, and educators from Rutgers Haskin Shellfish Research Lab. Currently, the training program is expanding and transitioning into a Certified Master Shellfish Grower Program.

In addition, a multifaceted public outreach program has been undertaken, including volunteers reaching out to the public at fairs and festivals, on site upweller education, teaching lectures, and workshops. In addition, a curriculum activity guide (What the Bay HINGES On) was produced and has been distributed to educators. The guide was also the basis of a six lesson youth experience (Clam Camp) piloted at the St. Francis Community Center on Long Beach Island. In addition, a public art and education project (the Clam Trail) was showcased in late summer 2007 for both local residents and tourists to the Long Beach Island, NJ area. The project used 5 ½ foot fiberglass clams painted by local artists and sponsored by businesses to attract residents to important local and cultural features. Each site also had a "Clam Clue" offering a fact about Barnegat Bay, water quality, shellfish or ecology. When participants record their clues, and tally their points, they can send in their forms to win prizes. In this way, the Clam Trail highlights local businesses and cultural features, the ecological value of the Barnegat Bay, and sends people home with new knowledge and ideas of how they can improve their own environment.

Results

What the Bay HINGES On:The Hinges guide was presented in four educator workshops in 2007. The workshops 31 participants ranked the value of the workshop value 4.67 (1-5, five=excellent). Thirty six educators received the guide in New Jersey, Washington, Virginia, the Netherlands, and Northern Ireland. Nine educators responded to an anonymous web survey about the guide, three of which had just received it and not had a chance to use it. Of the remaining six, fifty percent self reported learning between five and seven new ideas on average. The remaining 50% of responses were evenly distributed between zero and ten ideas. Respondents reported using the guide "sometimes" (Frequently, sometimes, rarely, not at all) for background information collection, construction of activities and demonstrations, and to find resources on related topics. Sixty percent of the respondents reported the guide helping them reach their students more effectively, and increasing their student's knowledge of coastal water and shellfish topics.

Clam Camp: In addition to lessons being presented to educators for their use, materials from the guide were used to construct "Clam Camp", a series of lessons on the Shellfish Restoration Program presented to Ocean County youth. In 2007, 60 youth received clam camp instruction. The students rated that they learned about both growing clams and stewardship (2.4 and 2.2 respectively, on a scale of 1-3, 3 being "a lot"). Approximately 83% of the students said they would try new or different behaviors to be better stewards, and 82% said they would share what they learned with someone else.

Clam Trail: Fourteen individuals/groups completed the clam trail between mid-July and September of 2007. The respondents are from six different states so far, including Indiana and Texas. Evaluation surveys have not been returned as of yet, however there are indications that the experience had an effect on the participants. An elementary school student from Round Rock Texas who visited last summer has constructed a science fair project based on his experience to teach his classmates about the Barnegat Bay and Shellfish Restoration.

4. Associated Knowledge Areas

KA Code	Knowledge Area
135	Aquatic and Terrestrial Wildlife

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought,weather extremes,etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programatic Challenges
- Populations changes (immigration,new cultural groupings,etc.)

Brief Explanation

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- Before-After (before and after program)
- During (during program)
- Time series (multiple points before and after program)
- Comparisons between program participants (individuals,group,organizations) and non-participants
- Comparisons between different groups of individuals or program participants experiencing different levels of program intensity.
- Comparison between locales where the program operates and sites without program intervention

Evaluation Results

Evaluation results are unique to each program. See Qualitative Outcome Statements.

Key Items of Evaluation